

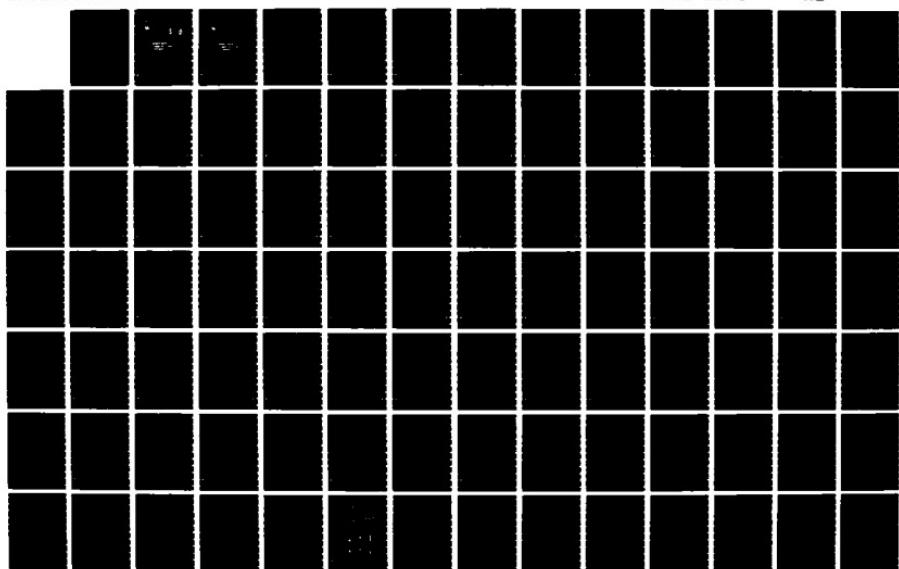
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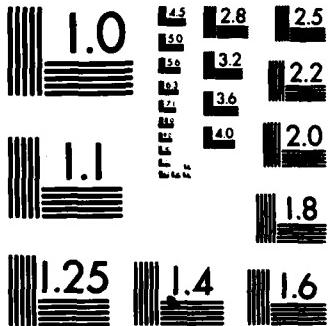
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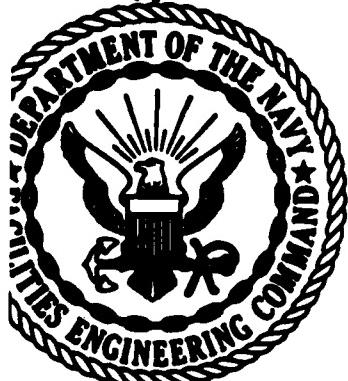
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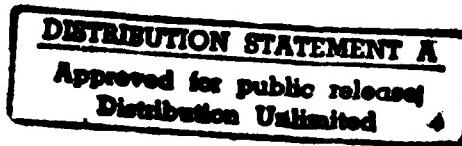


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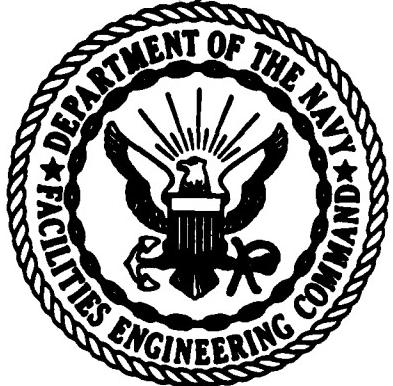


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NAVAL FACILITIES ENGINEERING COMMAND
200 STOVALL STREET
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ABSTRACT

This publication provides guidelines for the management of transportation equipment. Procedures for administration, operation, and maintenance are detailed herein, including procurement, technical record control, disposition of equipment, and procedures for operation. Automotive, construction, weight handling, and railroad equipment are covered. Such maintenance areas as scheduling; shop control; supply; equipment modification; painting, protective coatings, and markings; and guidelines for fuels and lubricants are presented.

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FOREWORD

This publication has been prepared by the Commander, Naval Facilities Engineering Command. The policies set forth herein implement the policies of the Chief of Naval Operations as prescribed in OPNAVINST 11240.16 and DOD Regulation 4500.36R applicable to motor vehicle management. These policies and procedures are mandatory for all personnel concerned with the management of transportation equipment throughout the Navy.

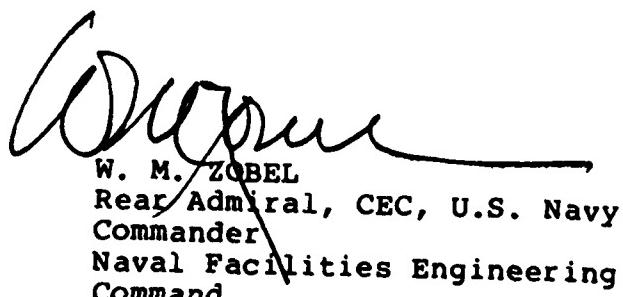
The purpose of this publication is to assist all management levels in properly discharging responsibilities in the efficient management of transportation equipment. The instructions, guides, procedures, and criteria for exercising both technical and management controls are provided to attain full and cost effective utilization of funds, personnel, and equipment.

All aspects of the administration, operation, and maintenance of transportation equipment are covered. These encompass such areas as administration, procurement, rental, charter, assignment, loan, utilization, registration and technical record control, disposition of equipment, and operational procedures for automotive, construction, weight handling, and railroad equipment. In addition, this publication covers maintenance planning, scheduling, shop control, supply coordination, modification of equipment, painting, identification markings, protective coatings, the maintenance management of all weight handling equipment, and guidelines for selection and application of fuels and lubricants approved for automotive and construction equipment.

This publication is certified as an official publication of the Command, and, in accordance with the SECNAVINST 5600.16, has been reviewed and approved.



D. G. ISELIN
Rear Admiral, CEC, U.S. Navy
Commander
Naval Facilities Engineering Command



W. M. ZOBEL
Rear Admiral, CEC, U.S. Navy
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Naval Facilities Engineering
Command

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MANAGEMENT OF TRANSPORTATION EQUIPMENT

CHAPTER 1. PURPOSE AND SCOPE

- ◆ 1-1. Purpose. This publication is a compilation of policy instructions issued by the Secretary of the Navy (SECNAV), the Chief of Naval Operations (CNO), the Chief of Naval Material (CHNAVMAT), and the Commander, Naval Facilities Engineering Command (COMNAVFACEENGCOM). It provides administrative and technical instructions and procedures for all personnel concerned with the administration, operation, and maintenance of automotive vehicles, construction, railway, firefighting, and weight handling equipment generally referred to as transportation equipment.
- 1-2. Scope. These procedures apply to responsibilities of NAVFACENGCOM for the allowances, requirements, procurement, assignment, registration, technical record control, inventory reporting disposition, operation and maintenance of automotive vehicles, construction, railway, firefighting, and weight handling equipment. Policies and responsibilities of other commands, bureaus, and offices are presented insofar as they affect NAVFACENGCOM in performance of its responsibilities. A glossary of transportation equipment terms and a list of related publications are included as Appendices A and B respectively of this publication.
- 1-3. Cancellation. This publication supersedes and cancels NAVFAC P-300 June 1980 entitled "Management of Transportation Equipment."
- 1-4. Authority. By authority vested in it by instructions of SECNAV, CNO, and CHNAVMAT, NAVFACENGCOM has technical responsibility for administration, operation, and procurement of transportation equipment for the Navy except that of the Marine Corps and as otherwise provided by higher authority. NAVFACENGCOM also has technical responsibility for programs for the maintenance, alteration, repair, and upkeep of transportation equipment and of the operating standards and procedures pertaining thereto. This publication also establishes standards and procedures for testing and licensing of all Navy equipment drivers and operators.
- 1-5. Department of Defense Vehicle Policy. The Department of Defense (DOD) policy on the management, acquisition, and use of motor vehicles (DOD Regulation 4500.36R) as promulgated by OPNAVINST 11240.16 is further augmented in depth and detail for Navy use by this publication and related NAVFACENGCOM Instructions.

CHAPTER 2. RESPONSIBILITIES AND STAFF TECHNICAL ASSISTANCE

2-1. Program Responsibilities for Automotive Vehicles, Construction, Railway, Firefighting, and Weight Handling Equipment.

a. Naval Facilities Engineering Command. By authority of SECNAV, CNO, and CHNAVMAT Instructions, the technical responsibility of NAVFACENGCOM for transportation equipment includes the specific Navy responsibilities following. This category of equipment is described in the procurement budgeting area as Civil Engineering Support Equipment (CESE).

(1) Procure and administer the assignment and utilization of transportation equipment in accordance with the military requirements established by CNO and the operational requirements of offices, bureaus, and commands (claimants).

(2) Establish and promulgate standards for operation and general utilization.

(3) Prepare and promulgate maintenance standards.

(4) Administer public laws relating to:

(a) Commercial type and school bus operations.

(b) Official use of Government-owned and operated vehicles.

(c) The sale, replacement, and retirement of assigned equipment in accordance with the DOD Disposal Manual, DOD 4160.21M as amended.

(5) Maintain current and complete inventory files and records for all activities, ashore and afloat.

(6) Assign registration numbers.

(7) Promulgate criteria for replacement and retirement in compliance with the DOD guidance and establish and promulgate such criteria where specific guidance of DOD is lacking.

(8) Develop specifications, initiate their coordination with other interested activities, and expedite their adoption as coordinated specifications in either the Federal or Military series.

(9) Consolidate and furnish equipment allowance documents to CNO for approval.

(10) Establish standards for qualifications, training, and indoctrination of professional, technical, and supervisory employees concerned with the types of equipment assigned.

(11) Effect standardization of equipment as practicable in conformity with procedures established for the DOD Standardization Program.

(12) Through command channels and in coordination with other offices, bureaus, and commands determine Navy-wide requirements in support of programs and allowances authorized by CNO.

(13) Through command channels verify, determine the degree of, and assist in the compliance with technical standards and safety regulations.

(14) Act as a central clearing agency for the Navy in exchanging and disposing of assigned equipment.

(15) Coordinate requirements for cost accounting and cost reporting procedures with the Comptroller of the Navy (NAVCOMPT) and other offices, bureaus, and commands (claimants).

b. Naval Supply Systems Command. The Naval Supply Systems Command (NAVSUPSYSCOM) has the responsibility to procure and administer the assignment and utilization of all materials handling equipment except specialized types in accordance with the military requirements established by CNO and operational requirements of the management offices, bureaus, and commands (claimants). Materials handling equipment may be maintained in transportation equipment shops.

2-2. Support of Marine Corps Security Forces at Naval Activities.

a. The Navy is responsible for providing official-use transportation support to Marine Corps security forces assigned to naval activities to the extent necessary to accomplish on-station security services.

b. The Navy is responsible for the procurement of ambulances and special medical vehicles assigned to Marine Corps activities that have not been consolidated under the Navy Regional Medical Center Program.

2-3. Staff Technical Assistance. To facilitate execution of the policies and procedures set forth in this publication and to accomplish assigned centralized technical responsibilities for the transportation equipment program, an organization designated as the Transportation Equipment Management Center (TEMC) has been established within the NAVFACENGCOM Engineering Field Divisions (EFD's) as follows.

a. Technical Assistance Designations for Commands (Claimants) Headquartered Outside Washington Metropolitan Area.

(1) <u>Commands (Claimants)</u>	(2) <u>TEMC</u>
CINCPACFLT	PACNAVFACEENGCOM Pearl Harbor, HI
CINCLANTFLT	LANTNAVFACEENGCOM Norfolk, VA
CINCUSNAVEUR	LANTNAVFACEENGCOM Norfolk, VA

Chief, Naval Education and Training (CNET)	SOUTHNAVFACENGCOMBRO Pensacola, FL
Oceanographer of the Navy (OCEANAV)	SOUTHNAVFACENGCOM Pensacola, FL
Chief, Naval Reserves (CHNAVRES)	SOUTHNAVFACENGCOMBRO Pensacola, FL

b. Technical Assistance Designations for Commands (Claimants) Headquartered in Washington Metropolitan Area.

(1) <u>Commands (Claimants)</u>	(2) <u>TEMC</u>
All Washington Metropolitan Area Commands (Claimants)	Chesapeake Division, (CHESNAVFACENGCOM) Washington, DC

The TEMC's promulgate the program and administer the assignment, replacement, and disposal of transportation, construction, firefighting, and weight handling equipment and provide technical advice and assistance in the maintenance and utilization thereof.

2-4. Transportation Assistance Visits. Assistance and field activity analysis of administration, operation, and maintenance of transportation equipment is made by technical TEMC representatives. The objective of the assistance visit and analysis is to assist the activity in technical and management procedures that will increase the efficiency and effectiveness of the overall transportation equipment operation of the activity. In general, these assistance visits should include validation of transportation equipment allowances, utilization, and requirement development including applications engineering, operations, and maintenance.

2-5. Frequency and Reporting. Transportation assistance visits should be made annually at activities operating 50 or more units of transportation equipment. A report of the visit analysis and findings shall be made to the Commanding Officer of the activity concerned prior to departure and shall include items of major interest. Priority shall be given to activities where the potential for cost payback is the greatest. At activities operating fewer than 50 units of transportation equipment, the analysis may be conducted every 3 years or when assistance is specifically requested.

the effective edition of NAVFACINST 11200.12. As basic criteria, CESE replacement must be within claimant and activity allowances and must qualify for replacement in accordance with the life expectancies listed in Appendix C. This does not mean that equipment will be replaced automatically as soon as it is eligible for replacement. Replacement of eligible units will be predicated on the funding approved for the purchase of CESE. Guidance on equipment selection is provided in Appendix D.

3-5. Procurement of Fuel Efficient Light Vehicles. Recent laws and regulations require compliance in the fuel efficient acquisitions (purchase, hire, lease, or rental) and reporting of light passenger automobiles (sedans and station wagons) and light trucks. The future procurement (purchase, hire, lease, or rental) of sedans and station wagons is limited to compact or subcompact type except as authorized by specific DOD policy.

a. Sedan Standards. A summary of the manufacturer's average sedan fuel economy standard by fiscal year and the special additional average fuel economy standard for the Federal sedan fleet is as follows.

<u>Fiscal year</u>	<u>Miles per gallon</u>
	<u>Manufacturer's average fuel economy standard¹</u>
1978	18.0
1979	19.0
1980	20.0
1981	22.0
1982	24.0
1983	26.0
1984	27.0
1985	27.5

b. Light Truck Standards. A summary of the manufacturer's average light truck fuel economy objectives by fiscal year is as follows (the fleet average fuel economy is based on the total number of light trucks acquired during a fiscal year by executive agencies).

¹Established by Section 502 of the Motor Vehicle Information and Cost Savings Act (89 Sta. 902, Title 15 U.S. Code 2002) and the Secretary of Transportation.

**Fleet average fuel economy
(miles per gallon)**

<u>Fiscal year</u>	<u>4 X 2</u>	<u>4 X 4</u>
1979	17.2	15.8
1980	16.0	14.0
1981	16.7	15.0
1982	18.0	16.0
1983	19.5	17.5
1984	20.3	18.5
1985	21.6	19.0

3-6. Hire of Motor Vehicles.

a. Authority. The authority, procedures, and limitations on the hire of motor vehicles by naval activities ashore and afloat are contained in DOD Regulation 4500.36R. The full-time hire (exceeding 60 days), charter, rental, or lease of motor vehicles is restricted to activities ashore for filling the office, bureau, or command (claimant) vehicle allowance which has been approved by CNO.

b. Administration. Offices, bureaus, and commands (claimants) are responsible for budgeting and funding for the hire of motor vehicles for both full-time and intermittent purposes. NAVFACENGCOM is responsible for the development and promulgation of technical and economic criteria for full-time motor vehicle hire, contracting procedures, and reporting requirements for maintaining Navy-wide hire allowance control at the CNO level. NAVFACENGCOM is also the point of contact for the Navy for the conduct of studies and participation in the establishment of General Services Administration (GSA) Interagency Motor Pools and Systems (see paragraph 12-3).

c. Criteria. GSA Interagency Motor Pools and Systems and commercial transportation facilities should be used to the maximum extent when efficient and economical service can be made available without detriment to the military mission. Motor vehicles may be hired when the following conditions exist:

- (1) When it will result in cost benefits to the Government.
- (2) When unforeseen requirements develop which must be satisfied before vehicles can be obtained through annually-approved procurement programs.
- (3) Where local laws or status of forces agreements preclude the use of Government-owned vehicles.
- (4) Vehicles also may be hired under the following conditions:

(a) Sixty-day Lease. Activities may, within funding limitations, hire motor vehicles for periods not exceeding 60 consecutive days without regard to established allowances, to satisfy peak loads, or unusual or emergency requirements.

(b) Leases Exceeding 60 Days. Except for vehicles to be used by the officials listed in paragraph 3-1c of the DOD Regulation 4500.36R, new or renewed leases for more than 60 calendar days for commercial type vehicles, for which the total annual cost exceeds \$500, shall be subject to the following approval requirements:

i For vehicles within the United States (the 50 States and the District of Columbia), prior approval shall be obtained from GSA by NAVFACENGCOM or his designee (EFD (TEMC)).

ii For vehicles outside the United States, prior approval shall be obtained from NAVFACENGCOM or his designee (EFD (TEMC)).

d. Buses. Full-time hire of buses may be considered to satisfy regularly scheduled and recurring requirements where Navy-owned equipment is not available or economical to use to meet operational demands. Requirements of less than 4 hours per day that require a full-time driver are likely prospects. Also, cyclic requirements of 9 or 10 months per year may present a favorable bus hire situation in that the cost of paying full-time drivers (12 months) may be avoided. The use of commercial buses is advocated for the movement of large drafts of personnel for distances in excess of 75 miles beyond the limits of the activity. Commercial bus use is also recommended where the need is occasional and to satisfy peak requirements.

e. Sedans and Station Wagons. The annual hire of compact/subcompact sedans and station wagons from GSA or commercial sources must be justified on the basis of economics unless otherwise authorized by CNO. Guidance in the application of the economic hire criteria for sedans under varying annual mileage conditions is provided in Figure 3-1. Appropriate cost adjustments must be made to the factors used in Figure 3-1 according to the current GSA or commercial rental rates, gasoline, operations, and maintenance costs being experienced in each geographical area where hire is being considered. Where exceptions have previously been approved, annual reapprovals will not be required.

f. Other Vehicles. Full-time hire of other motor vehicles may be considered when the projected cost per mile will be less than the cost of providing a similar service with Navy-owned vehicles or where the mission cannot be feasibly accomplished by other methods. Determination of the economics and feasibility of hiring these types of vehicles is to be made by the requiring activities in consonance with the cognizant EFD (TEMC). Figure 3-2 provides guidance in the application of economic hire criteria to light trucks under varying annual mileage conditions.

g. Limitations. Motor vehicle hires are governed by certain legislative constraints and economic considerations including the Balance of Payments Program. Restrictions are described in the NAVFACENGCOM Contracting Manual, NAVFAC P-68 (paragraph 2-109, Motor Vehicle Rental), and the DAR.

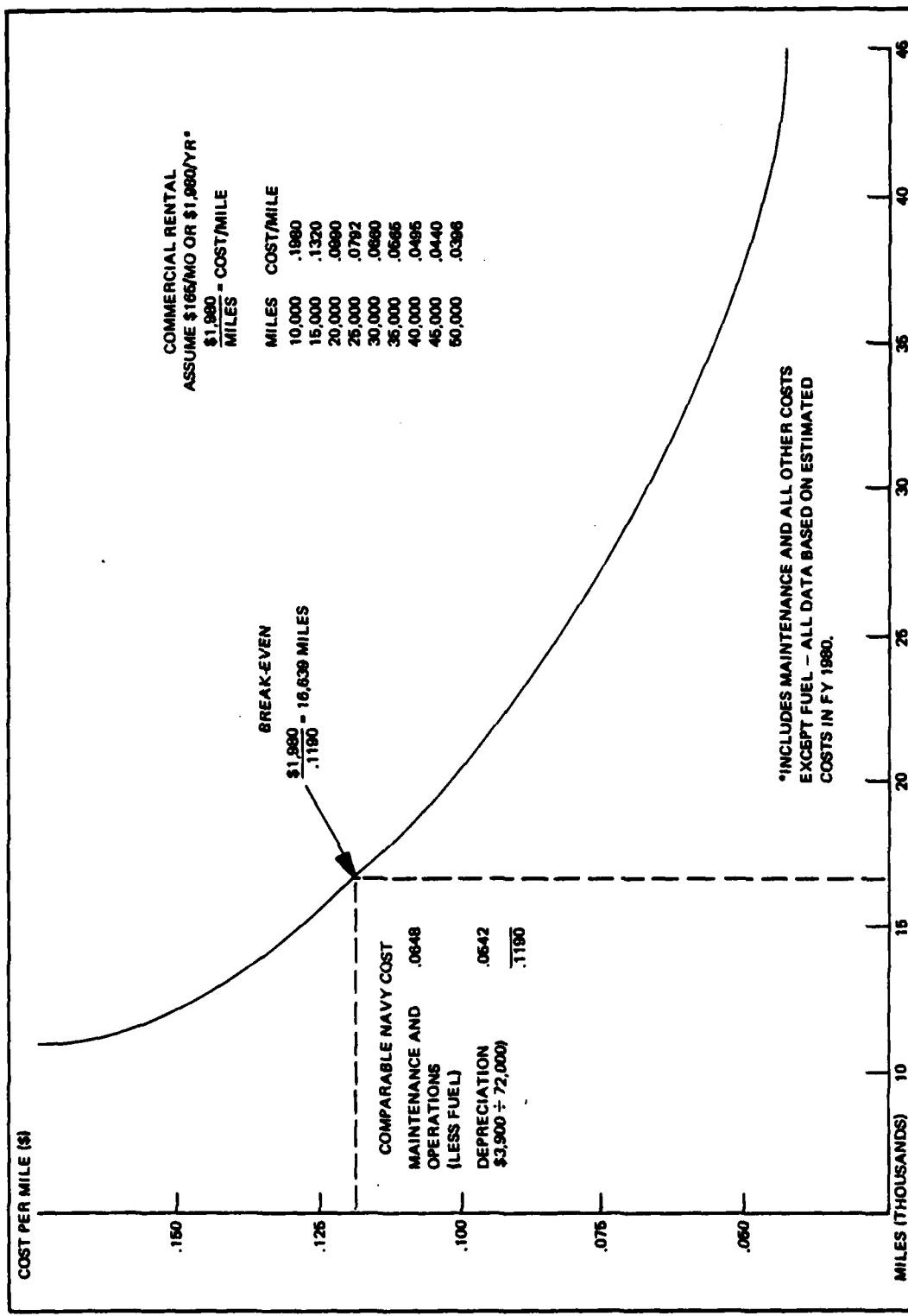


Figure 3-1
Economic Evaluation of Commercial Sedan Rental or Hire
vs. Navy-Owned Sedan

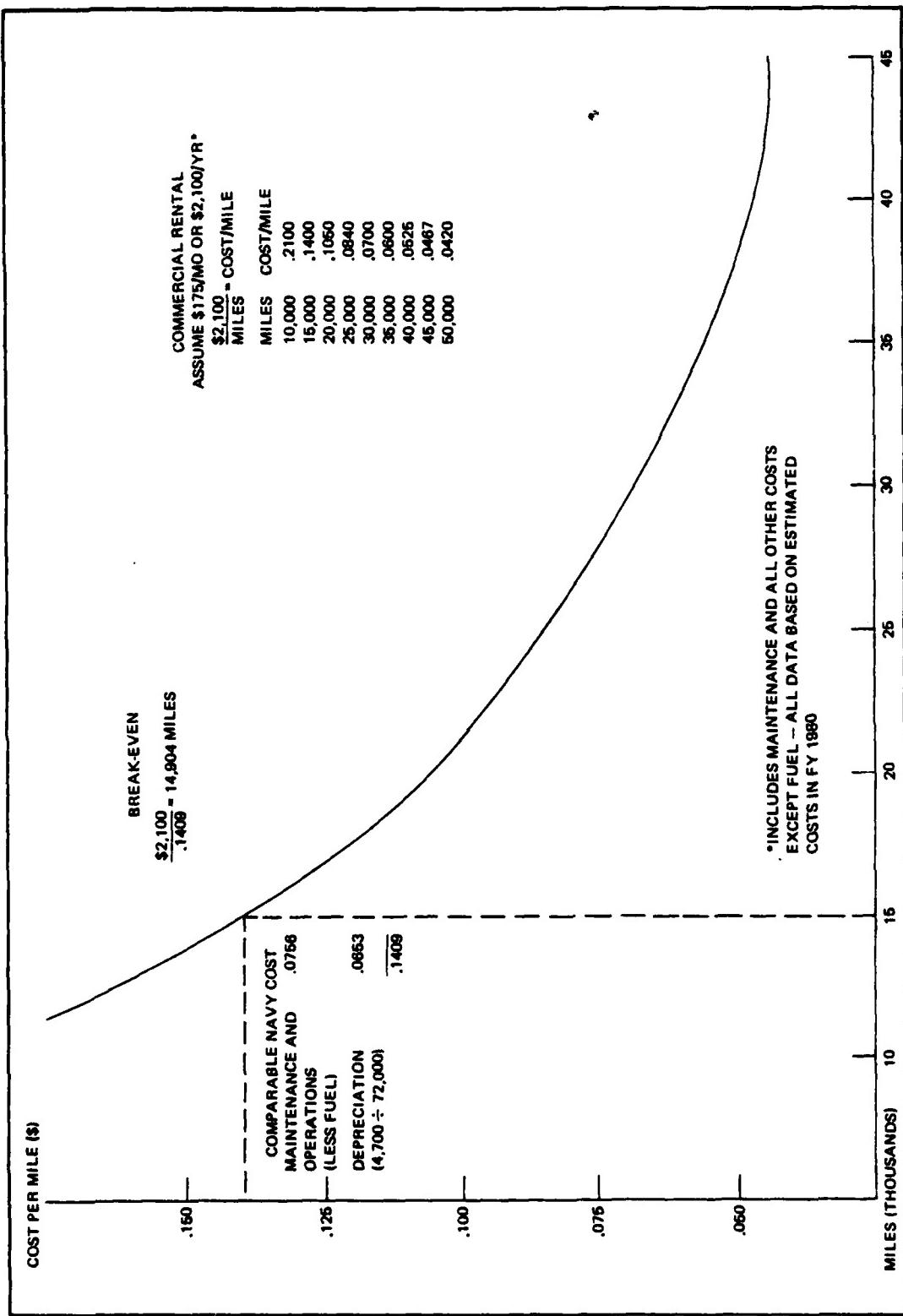


Figure 3-2
Economic Evaluation of Commercial 1/2-Ton Pickup Rental or Hire
vs. Navy-Owned 1/2-Ton Pickup

(1) Sedan and Station Wagon Hire. The hire or lease of sedans and station wagons is limited to compact/subcompact types. Action shall be taken to phase out standard light or larger size sedans and station wagons at the earliest practical date. Hire bid solicitation specifications shall conform to the design, weight, equipment, and accessory specifications that are employed for the purchase of Navy compact/subcompact sedans and station wagons. An exception is permitted when on the basis of documentation forwarded through established channels, the Principle Deputy Assistant Secretary of the Navy (Shipbuilding and Logistics) approves the use of larger sedans or station wagons as absolutely essential to an activity's mission. The exception must be certified to the Administrator of General Services in accordance with Federal Property Management Regulation Subchapter G Subpart 101-38.13.

h. Hire Allowances. The number of full-time motor vehicle hires shall not exceed the claimant rental allowance ceiling approved by CNO. Requests for hire or rental allowances or changes thereto shall be submitted in accordance with the effective edition of NAVFACINST 11200.12 in the same manner as for Navy-owned vehicles. Increases in vehicle rental allowances must be accompanied by a statement of the requiring activity that funding is available to cover the increased cost. Any decreases requested in existing passenger motor vehicle rental allowances will not be automatically exchanged for Navy-owned passenger vehicle allowances which are controlled separately by specific language in the annual DOD Appropriations Act.

i. Full-time Hire Requests. Activity requests for full-time vehicle hire and regularly scheduled charter bus service shall be submitted to the appropriate EFD (TEMC) by 1 July each year. Each request shall include the following data.

(1) Number of vehicles required by type (full-time hires only) or charter bus service required.

(2) Economic justification for hire.

(3) Comparison of hire costs with the cost of providing service with Navy-owned vehicles.

(4) Certification of the availability of funds to defray the hire/charter cost. Requests for the continuing hire of administrative use motor vehicles by activities that do not participate in GSA Interagency Motor Pools should be submitted to the claimant via the EFD (TEMC) for approval.

j. Intermittent Hire. Authority and procedures for intermittent/short-term (60 day) vehicle hire are prescribed in DOD Regulation 4500.36R. Intermittent/short-term charter bus service may be contracted for and/or administered by an EFD (TEMC) on a more advantageous cost basis. Where such benefits are to be gained, activities should utilize the services of an EFD (TEMC). Such requests should also be submitted to the EFD (TEMC) by 1 July annually.

k. Economic Justification. The appropriate EFD (TEMC) shall be responsible for the review and evaluation of the economic justification for annual full-time hire requests. Such review shall be completed early enough each year to ensure continuity of hire arrangements for the forthcoming year.

1. Insurance and Maintenance for Hired Vehicles.

(1) Invitation to bid solicitations and resulting contracts for hired vehicles shall provide for self-insurance or as otherwise prescribed by applicable portions of the DAR.

(2) Hired vehicles shall be operated in the same manner as prescribed for Navy-owned vehicles unless otherwise specified in the contract.

(3) The contractor shall perform all maintenance on hired vehicles when practicable unless a prior determination has been made that it will be more economical, or militarily necessary, for the Navy to perform such maintenance, in whole or in part.

m. Model Year of Hired Vehicles. As a rule, invitations for bids shall not be limited to current year production models. However, when overall economy is not affected, such solicitations may be limited to current models.

n. Marking Hired Vehicles. Vehicles hired from commercial sources for more than 60 consecutive days must be identified and marked in the same manner as Navy-owned vehicles. Hired vehicles shall not be repainted to conform to Navy vehicle colors. The application of markings on vehicles and the removal of such markings shall be subject to the agreement between the furnishing agency and the activity making the leasing arrangements.

o. Two-way Radio Equipment in Hired Vehicles. Normally, when two-way radio sets are required, vehicles shall be hired complete with appropriate radio equipment. Government-owned two-way radio sets may be installed in hired vehicles only when it is not feasible to use the hired radio equipment.

p. Vehicle Hire Contracts. Contract procedures and forms are prescribed in the NAVFACENGCOM Contracting Manual, NAVFAC P-68. Requirements for the hire of vehicles shall be consolidated by each EFD (TEMC) as feasible and invitations to bids shall be requested on a competitive basis with award to the lowest conforming bidder.

q. Report of Vehicles Hired, Chartered, Leased, or Rented. The activity Report of Hired Vehicles, NAVFAC Form 11240/4 (Figure 3-3), is to be prepared annually at the close of business each 30 September. An original and one carbon copy of NAVFAC Form 11240/4 are to be forwarded to the appropriate EFD (TEMC) in sufficient time to ensure its receipt by 20 October. In compiling the data for the cost columns, include only actual hire charter, lease, or rental charges as stipulated in the lease, rental, or charter agreement. Do not include cost of gasoline, oil, or repairs. Mileage and cost data for intermittent/short-term hires and intermittent/short-term charter bus services are to be excluded. The EFD (TEMC) will submit to NAVFACENGCOM by 10 Nov. annually the summary of the hired vehicles (NAVFAC Form 11240/4). One copy of the NAVFAC Form 11240/4, completed by the activities concerned, must be attached to the summary.

r. Report Symbol. Report Symbol NAVFACENGCOM 11240-7 applies to NAVFAC Form 11240/4.

s. Cost Reporting for Hired, Chartered, Leased, or Rented Transportation Equipment. For the purpose of Transportation Cost Report (TCR) (NAVCOMPT Manual, Volume 3, Chapter 7, paragraph 037160), hire/rental/charter of transportation equipment will be reported under the 6600 series of cost accounts as a total expense in column 10 of the TCR. Mileage/hours and costs are not to be included with the inventory reporting data for equipment groups A through Z.

t. Use of Navy-owned Vehicles on Official Travel. Navy military or civilian personnel traveling on official Temporary Additional Duty (TAD) orders may obtain the use of Navy-owned vehicles or services from public works centers if so authorized on the travel orders. Charging for the vehicle usage will be accomplished on Standard Form 1080, Voucher for Transfer between Appropriations and/or Funds, citing the appropriations accounting information given on the travel orders. Such support can be provided by the U.S. Navy Public Works Centers (PWC's) at Norfolk, VA; Great Lakes, IL; San Diego, CA; Oakland/San Francisco, CA; Pearl Harbor, HI; Guam, Mariana Islands; Subic Bay, Republic of the Philippines; Yokosuka, Japan; and Pensacola, FL.

3-7. Rental of Construction Equipment.

a. Procedure. As a means of assisting activities in meeting intermittent and peak requirements, procedures have been developed for obtaining construction and weight handling equipment on a rental basis from commercial sources.

b. Authority. Activity Commanding Officers may, within funding limitations, rent construction equipment for periods up to 60 consecutive days without regard to established allowances to satisfy peak loads or unusual or emergency requirements. The full-time rental (exceeding 60 days), or lease of construction equipment is restricted to activities ashore for filling the office, bureau, or command (claimant) equipment allowances which has been approved by CNO. Activities are responsible for budgeting and funding for the rental/lease of construction equipment for both full-time and intermittent purposes. Contract dollar limitations will be based on the contracting authority of the Officer in Charge of Contracts.

c. General Provisions for Construction Equipment Rental. Activities wishing to rent construction and weight handling equipment should generally consider the following elements in soliciting bids:

(1) Equipment Rental Rates. These rates shall include all costs of loading and unloading the equipment at the contractor's plant, including dismantling and assembling charges as necessary. If the Government is able to provide the equipment operator and the contractor is willing to rent the equipment without the operator, this should be clearly indicated. If the equipment is rented with operator, the regular hourly wage rate of the operator and the overtime rate should be indicated.

(2) Moving Costs. These costs are applicable in the event the contractor delivers the equipment to the job site. The moving costs should be shown as the costs per move plus mileage. For example, the cost of a move for a small crawler tractor to a Government job site might be \$20 per move plus 50 cents per mile of the distance one way.

(3) Termination of Lease by Government. The Navy should reserve the right to terminate this equipment rental upon due notice if it is determined to be in the best interest of the Government. The Navy will be responsible upon termination of the lease to return the equipment in as good condition as when delivered, less normal wear and tear. The Navy shall not be responsible nor obligated to pay for any damages resulting from the negligence of the contractor or his employees.

(4) Maintenance of Equipment. If equipment is rented and in the custody of the Government in excess of 1 day (8 hours), the Government should be responsible for and perform normal operational-type services. Operational-type services should consist of fueling, lubrication, battery service, checking air pressure in tires, adding oils, etc. Such services will be performed by the Navy in the manner prescribed by the contractors. Unless otherwise specified in the agreement, the contractor shall be responsible for, and at his expense maintain the equipment in good operating condition during the leasing period (in the terms of this agreement, this shall include labor or replacement parts as applicable). In the event the equipment must be taken out of service by the contractor to perform repairs during the normal working day, such time will be deducted from rental payments in the applicable amount of the rate established. Should the contractor be unwilling or fail to make the necessary repairs or replacement of parts to maintain or restore the equipment to good operating condition, the Government should have the option to terminate the lease and return the equipment or arrange with the contractor, as applicable, to have the equipment returned to the point of origin.

(5) Insurance. Normally, the U.S. Government acts as a self insurer. When an Officer in Charge of Contracts considers that he may be dealing with unusual circumstances which warrant requiring the contractor to take out special insurance to protect him from unusual losses, the matter shall be referred to NAVFACENGCOM.

(6) Liability of the Contractor. The contractor will be responsible to ensure that equipment scheduled for rental to the Government, in accordance with the terms of the specification, is free from defects and in good, dependable, and safe operating condition. The Government shall have the option, if so desired, to inspect the equipment for condition prior to entering into an agreement with the contractor for equipment.

d. Rental Allowance. Construction and weight handling equipment rental required in excess of 60 days and up to a limit of 90 days will require approval from NAVFAC. Rental or lease in excess of 90 days will require a rental allowance. Rental allowances shall be requested from CNO in accordance with existing procedures through the appropriate chain of command.

CHAPTER 4
USE OF GOVERNMENT VEHICLES FOR OFFICIAL PURPOSES

4-1. Official Use. The use of all Navy-owned and controlled motor vehicles shall be restricted to official purposes only. The term "official purposes" means that travel must be performed by a person in official capacity as an officer or employee. This precludes the use of Government vehicles for personal use. The purpose of the trip must be related to the performance of official duties or in connection with activities conducted under official authorization.

a. Legislative Constraint. Section 638a(c)(2) of Title 31, U.S. Code, provides in pertinent part that official purposes shall not include transportation between domiciles and places of employment except in cases of medical officers on outpatient medical service, and officers and employees engaged in field work, and the character of whose duties makes such transportation necessary, and only as to such latter cases when approved by the head of the department concerned. This restriction on transportation between domicile and place of employment applies to transportation to, from, and within, as well as that wholly outside Navy installations. The same statute exempts from this limitation any motor vehicles for official use of the President, the heads of executive departments enumerated in Title 5, U.S. Code, 101, principal diplomatic officials, and certain others.

b. Exemptions.

(1) Pursuant to the exemptions granted by Title 31, U.S. Code, 638a(c)(2), certain DOD officials listed in Appendix B of DOD Regulation 4500.36R are authorized to use Government-owned or controlled motor vehicles for transportation between their domiciles and places of employment, as heads of executive departments and principal diplomatic officials.

(2) Transportation between domicile and place of employment is also authorized in the following cases.

(a) Medical officers. Such transportation is authorized for medical officers while performing outpatient medical service away from a hospital.

(b) Field work. Transportation may be approved by SECNAV for personnel while engaged in field work when the character of their duties makes such transportation necessary and other transportation is not adequate. The officer or employee must be engaged in field work. An individual is engaged in field work when he does not report regularly to the same post before entering upon his official duties. A person who reports to a regular office before embarking on his daily work is not engaged in field work within the definition; he may be entitled to Government transportation from his post to places in the field where his duties may require his presence, but he would not be entitled to transportation between his domicile and post.

(c) Military recruiters who proceed directly from their domiciles to conduct official recruiting matters when it is determined to be infeasible or impractical for the recruiter to first proceed to an office location where the government vehicle is normally garaged.

(d) Personnel proceeding on temporary duty (TDY) directly from their domicile when they have been authorized the use of a government-owned vehicle for that purpose and it has been determined by the head of the installation/activity that it would be infeasible, impractical, or more costly to have the DOD member proceed first to the normal duty station to obtain the vehicle before leaving on the directed TDY.

(e) Radio-equipped, emergency-configured vehicle may be provided on a 24-hour-a-day basis to commanders who live on the military installation, who are charged by the head of the military department concerned with the overall responsibility for installation security and/or operational functions, and who cannot adequately discharge this responsibility without a 24-hour mobility and communication capability. Such use must be individually approved by SECNAV. In the case of leave or extended absence from the station, the commander will pass the specially equipped vehicle to the individual assuming the responsibility.

Terrorist activities. The Chairman of the Joint Chiefs of Staff, with the authority to delegate to the Commanders of Unified Commands and the Directors of Defense Agencies who report to him, is authorized to approve the use of DOD-owned or leased vehicles for transportation between domicile and place of employment in those limited essential cases involving DOD personnel stationed overseas (outside the United States and its possessions), where it has been determined that there exists a clear and present danger of terrorist activities, and then only when furnishing of such Government transportation will provide protection not otherwise available (see U.S. Code, Title 54 c.G.855 (1975)). Such approvals must be limited to the time that both of these conditions exist, and this authority may not be redelegated.

4-2. Domicile-to-Duty Approval Procedures.

a. Requests for authority to provide Government-owned vehicles to officers or employees engaged in field work shall be submitted with full justification to SECNAV via the chain of command.

b. Transportation between domicile and place of employment shall not be provided because of the applicant's being on call constantly, or because he must be prepared to leave at any moment in the event of an emergency.

4-3. Illegal Use Penalty. Section 638a(c)(2) of Title 31, U.S. Code, provides that "Any officer or employee of the Government who willfully uses or authorizes the use of any Government-owned passenger motor vehicle . . . , or of any passenger motor vehicle leased by the Government, for other than official purposes or otherwise violates the provisions of this paragraph shall be suspended from duty by the head of the department concerned, without compensation, for not less than 1 month, and shall be suspended for a longer period or summarily removed from office if circumstances warrant."

4-4. Use of Government Vehicles in the National Capital Region. Special instructions describe the policy and procedures for use of Government vehicles in the greater metropolitan area of Washington, D.C., generally referred to as the National Capital Region. Included in the National Capital Region program are the Navy Department motor pool, bus service between various agencies, and certain other official transportation. Details are available in SECNAV Instructions 11240.17A and 11240.18 (current editions).

CHAPTER 5. ASSIGNMENT

5-1. General Assignment Criteria. Transportation equipment will be assigned only to those shore activities that have an allowance approved by the claimant of the activity requiring the equipment. Replacement and additional equipment are to be assigned by the appropriate EFD (TEMC). Assets will be supplied either from new procurement or by redistribution of excess. Only sufficient transportation equipment to carry out the stated mission adequately and within reasonable limits will be assigned to a naval activity. Subsequent and continuing determinations and justifications of requirements will be based upon analyses of equipment use and military requirements. The equipment selected for an individual task shall be the best suited by virtue of size, configuration, and economy of operation. Differences in activity missions, geographic layout, and locations of installations and facilities preclude complete uniformity in operational procedures. The following list, however, offers the essential elements of operations and resource management applicable to all assignments.

- (1) Provide for the pooling of administrative use vehicles.
- (2) Establish procedures for assignment and use of vehicles.
- (3) Establish a central dispatch point for control.
- (4) Periodically review requirements and make reassessments to satisfy changing conditions.
- (5) Provide for the most economical use of manpower and equipment.
- (6) Provide for the collection of operational data as a basis for inventory/allowance actions and cost performance reporting.
- (7) Provide for training of personnel.
- (8) Ensure the safety, security, and proper use of equipment.
- (9) Provide for rotation of vehicles, where practical and economical, to equalize equipment usage.
- (10) Use commercial type vehicles to the fullest extent to meet general transportation requirements.
- (11) Pool all equipment to ensure the highest effective level of use.

5-2. Assignment Controls. Subsequent to pooling of resources and establishment of administrative control under dispatching authority, effective management requires further evaluation of available vehicle resources against mission requirements. Normally, such evaluation will indicate that the bulk of the motor transport requirements can be supported by dispatching vehicles for short periods of time, to include "taxi" vehicles or vehicles driven by users. (See 5-2.c. following for Class C dispatch service.) The determining of justifiable requirements for all types of vehicle service shall be based on the following categories.

a. Class A--Continuing Assignments. Class A provides for a continuing dispatch assignment of a vehicle. It permits the incumbent of the designated billet to retain a passenger or nonpassenger vehicle on a standby basis in order that appropriate transportation will be immediately available. The vehicle must be absolutely essential to the accomplishment of mission. Personnel authorized Class A assignments shall not use such vehicles for other than the actual performance of official duties. CNO authorizes Class A assignments when appropriate. Requests for additions or deletions of effective Class A assignments will be forwarded to CNO via the normal chain of command. All forwarding endorsements should contain specific recommendations in order that CNO may have the information and background on which to base a decision. Authorized Class A assignments neither provide nor change vehicle allowances, and are not to be construed as prestige assignments nor as waivers of marking and identification requirements established by law.

b. Class B--Reoccurring Assignments. The Class B assignment is the assignment of an automotive vehicle authorized in writing by the local commander to an organizational unit of the command or a tenant activity on a regular or continuous basis for the conduct of official business. Such an assignment is contingent on meeting the requirements which cannot be met by use of pool equipment or other types of available transportation. Certain exceptions may be made for unusual operating conditions; however, the exceptional conditions must be real and not merely so described to avoid the use of pool vehicles (Class C assignment). Periodic surveys are to be made of all Class B assignments to ensure that vehicles are not being used on a convenience basis and are actually required to efficiently support the conduct of official business of the activity, office, or department to which assigned. Where vehicles are continuously assigned to customer activities from a lead or support activity, a review of the assignments is to be conducted at least annually by the cognizant command or area commander, with appropriate action taken to maintain the continuous assignments at a minimum consistent with good management practices. The appropriate EFD (TEMC) will review Class B assignments during assistance visits and make economic evaluation toward use of a radio-controlled taxi system to satisfy requirements for movement of personnel in lieu of maintaining vehicles in a Class B assignment category.

c. Class C--Pool Vehicles. Maximum pooling of vehicles at all levels within a naval activity is to be emphasized. Assignments on a Class B basis shall not be made if it is possible to use pool vehicles. Pooling of vehicles is to be accomplished at all activities having two or more vehicles when practicable.

5-3. Trip Tickets. The Motor Vehicle Utilization Record (DD Form 1970) shall be employed as the basic manual source document for information concerning the utilization of motor vehicles and shall be prepared in accordance with instructions on the back of the form. Navy activities using mechanized/computerized motor vehicle utilization data gathering systems shall establish operating procedures to implement this requirement. The use of the trip ticket for Class A and Class B assignments on station will be optional and is to be determined by the activity Commanding Officer. Trip tickets will be required daily for all off station and Class C pool vehicle dispatching. Whenever a utilization study is required, it will be necessary to apply the trip ticket to all operations.

5-4. Dispatcher's Log. The dispatcher's log (NAVFAC Form 9-11240/2) is shown in Figure 5-1. It will be used to record all vehicles dispatched off station and for all Class C pool vehicles. The dispatcher's log provides space for recording accounting data (job order number) not provided for in DD Form 1970. The dispatcher's log and the DD Form 1970 will be destroyed 12 months after the entries have been completed.

5-5. New Transportation Equipment Assignment.

a. Light Vehicles. New light vehicles shall be assigned to those organizational segments of a naval activity where there is the greatest likelihood of high mileage and maximum use. In general, this means that new vehicles should be assigned on a Class C basis for pool operation; and on a Class B basis to those segments of the naval activity where essential vehicle trips consistently range beyond the immediate vicinity and result in high mileages, or to security patrols generating high mileages.

b. Buses. A bus may be assigned to an activity when it will provide required economical transportation. The passenger capacity of the bus or buses assigned should, within reasonable limits, be commensurate with the maximum number of passengers to be transported at peak load. Maximum use must be obtained from any bus assigned. To handle peak traffic or short hauls, increased frequency of trips is expected rather than the assignment of additional buses. Generally, a bus operation that is efficient must have a schedule of not more than 20 minutes waiting time between trips. The schedule must be maintained during hours of normal service and supplemented as necessary during peak periods.

c. General Purpose Trucks. In determining the need for a truck with a load-bearing body, the following factors are to be considered.

(1) Maximum use shall be made of any truck assigned to an activity.

(2) As practicable, an assigned truck shall be required for a minimum operation of 4 hours a day.

(3) The criteria stated in 5-2 preceding for Class B and Class C vehicle assignments apply to the assignment of general purpose motor trucks. Information on equipment selection is provided in Appendix D.

d. Special-Purpose Vehicles. The general purpose truck criteria do not apply to trucks mounting special equipment, such as lubricating equipment, welding machines, compressors, and refrigerating units. Requirements for special-type vehicles shall be based on activity needs for the service rendered by the mobile equipment. Trailer-mounted rather than truck-mounted equipment will be used wherever feasible.

e. Construction and Railway Equipment. Only sufficient construction equipment and railway equipment shall be assigned to a naval activity to adequately carry out its stated mission. Subsequent and continuing determination and justifications of requirements shall be based on analyses of equipment utilization by the naval activity. Information on equipment selection may be found in Appendix D.

DISPARITIES LOG

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Figure 5-1
Dispatcher's Log

5-6. Assignment to Commissaries, Exchanges, and Messes Ashore. The assignment of vehicles to commissary stores, Navy exchanges, messes, and similar special service functions ashore shall be based on the premise that no vehicles are to be assigned for the exclusive use of any division of an activity (special-purpose vehicles excepted) unless the volume of work performed by such vehicle is sufficient to make the assignment economically justifiable. Navy-owned vehicles procured with appropriated funds may be assigned to these activities if available and the circumstances justify. The general policy of vehicle assignment to commissaries, exchanges, and messes ashore is shown in Appendix E. Commissary store vehicles are procured with Commissary Store Reserve Funds as required to meet the needs of specific store activities. The funds used to support the initial procurement cost, maintenance, and operation of commissary store vehicles are expended from the Navy Stock Fund.

5-7. Assignment to Nonappropriated Fund Activities. The general policy of vehicle assignments to nonappropriated fund activities is contained in Appendix E. Further guidance is as follows.

a. Excess Personal Property. Nonappropriated fund activities may obtain excess personal property for administrative purposes in accordance with Part 2, Chapter 6, paragraph 4 of the Defense Disposal Manual (DOD 4160.21M), current edition. In the case of foreign excess, which is not reportable to GSA, such foreign excess personal property should be available to nonappropriated fund activities during the normal local area screening periods in accordance with Part 2, Chapter 5 of the Defense Disposal Manual, and under such controls as may be prescribed by the area or theatre commanders. Nonappropriated fund activities may likewise obtain nonreportable excess property located in the U.S. during the same period that such property is available to other Federal agencies.

b. Assignment to Special Services. Special Services may be permitted free use of Navy-owned vehicles, where available, for official recreation business when such use is approved by the Commanding Officer. Special Services also are assigned and operate recreation vehicles purchased from nonappropriated fund accounts. The nonappropriated fund policies and procedures for the administration, operation, and maintenance of vehicles owned by Special Services are contained in the Special Services Manual (BUPERS Instruction 1710.11).

5-8. Assignment of Transportation Equipment to Ships and Afloat Commands.

a. Support Responsibility. The transportation vehicle/equipment support of afloat commands and ships is an integral part of the Navy-wide transportation equipment program. Procurement and assignment of vehicles and equipment are accomplished through NAVFACENGCOM Headquarters and its Atlantic and Pacific Divisions under the appropriation Other Procurement, Navy, Civil Engineering Support Equipment.

b. Allowance Control. CNO has consolidated general administration of transportation equipment allowances for ships and afloat commands under the Fleet Commanders-in-Chief. Individual ship and afloat command vehicular allowances formerly under CNO have been deleted. Vehicular support for ships and afloat commands is now provided from Vehicular Service Pools administered by designated shore activities, or by hire arrangements authorized and funded

by the Commander-in-Chief, Atlantic Fleet (CINCLANTFLT) and the Commander-in-Chief, Pacific Fleet (CINCPACFLT). By special instructions, CINCLANTFLT and CINCPACFLT provide guidance and direction regarding automotive vehicles and equipment allowances for ships and afloat commands in the Atlantic and Pacific ocean areas, respectively. Allowances and integrated logistics support (ILS) procedures for specialized mobile equipment (crash fire trucks, aircraft crash cranes, and flight deck scrubbers) assigned to ships are provided by NAVFACENGCOM in accordance with the allowance list by ship type shown in Appendix F.

c. Shore Activities Serving In-Port Fleet Units.

(1) CINCPACFLT and CINCLANTFLT have designated shore activities to provide vehicle support to active ships of the Fleet from vehicle service pools. By furnishing transportation equipment to ships and afloat commands, the vehicle service pools essentially eliminate the need for carrying vehicles on board ships except for emergency and specialized types specified in the preceding paragraph.

(2) Activities assigned vehicle service pools will provide vehicle support to ships and afloat commands in accordance with allowances authorized by the Fleet Commanders-in-Chief.

(3) When the requirements of ships and afloat commands within authorized allowances exceed the quantity of vehicles and equipment available in a vehicle service pool, vehicles assigned to shore activities and departments will be withdrawn, or arrangements for commercial hire will be made by the shore activity to fulfill the authorized afloat needs. Commercial hire shall not be used until every effort has been made to reassign Navy-owned vehicles to meet the requirements.

(4) Transportation equipment for ships, afloat commands, and shore activities will be replaced on the normal replacement cycle set forth in Appendix C, and in accordance with the procedures set forth in the current edition of NAVFACINST 11200.12.

(5) Vehicles positioned in vehicle service pools for Fleet support may be used for daily requirements of the shore activity, provided that Fleet requirements are fulfilled.

(6) Transportation equipment assigned to ships and afloat commands are to be reported in the NAVFACENGCOM Construction, Automotive, and Specialized Equipment Management Information System (CASE/MIS) as in operating status, using the "O" designator.

(7) Ships in the Reserve Fleet, on reactivation, will obtain vehicle support from the designated support activity at the berthing area.

(8) Vehicles and equipment required to support ships under construction will be provided by the designated support activity.

d. Responsibilities for Transportation Equipment Support to Ships. The EFD's (TEMC's) are responsible for the following transportation equipment functions in providing support to ships.

(1) Review all transportation equipment support requests and validate that the units requested are within the authorized allowances.

(2) Inspect all items of transportation equipment requested for replacement, and determine whether the items are eligible or if repairs should be effected and the equipment retained in service.

(3) Assign transportation equipment to fill the initial allowances and authorized replacements within established allowances. Transportation equipment assignments to ships will be made by the Atlantic Division for ships in the Atlantic Ocean area, and by the Pacific Division for ships in the Pacific Ocean area. Other EFD's may also arrange assignments when requested and where the geographical location makes such action necessary and feasible. All EFD's making vehicle/equipment assignments to ships are expected to coordinate such actions with the Atlantic or Pacific Divisions as applicable.

5-9. Temporary Assignment or Loan.

a. Other Navy and U.S. Military Activities. The temporary loan of transportation equipment to other Navy and U.S. military activities may be made when such action is in the interest of economy and efficiency.

b. Nonmilitary Agencies of the Federal Government. No loan, assignment, or transfer of administrative use vehicles will be made to any nonmilitary Federal agency without prior approval of NAVFACENGCOM.

c. Assignment, Lease, or Loan of Nonexcess Transportation Equipment for Public or Private Civilian Use. Approval must be obtained from SECNAV before transportation equipment not in excess of the needs of a naval activity may be assigned, loaned, or leased to others for any public or private civilian use. Authority to lease transportation equipment to others will be issued only when the public interest or considerations of national defense will be clearly served (Title 10, U.S. Code, 2667, and NAVFAC P-315, Naval Construction Force Manual, 035655).

5-10. Assignment of Courtesy Vehicles. The free use of courtesy vehicles is not authorized, regardless of whether or not the lender is identified on the vehicle. The use of the Navy's name directly or by implication in connection with private or commercial firms to suggest official approval of a nongovernmental product or enterprise is not authorized. The vehicle transportation requirements of the Navy are to be satisfied by Navy-owned or authorized hire assets.

5-11. Assignments for Emergency and Disaster Purposes. Commanders charged with area coordination responsibility have the authority to override assigned responsibilities of other commanders where emergency or disaster situations arise, or when operational considerations involving the provision of effective support to the operating forces of the Navy clearly demand such action. In exercising such authoritative direction, the area coordinator concerned assumes full responsibility for his actions and shall promptly inform other cognizant commanders of the action planned or taken. (SECNAV Instruction 5400.14, current edition.)

CHAPTER 6. TRANSPORTATION EQUIPMENT UTILIZATION

6-1. Automotive and Construction Equipment Utilization Analysis Program. Utilization standards are established as management indicators to measure the average annual utilization for a particular type of vehicle at naval shore activities. Specific annual utilization standards for automotive vehicles, Alpha Code groups A through N (less Alpha Code group F) are listed in the current, DoD 4500.36R, "Management, Acquisition, and Use of Motor Vehicles". For construction, railway and weight handling equipment the program requires development of utilization "targets" based on historical milage or hours for equipment in Alpha Code groups S, U, W, and Y. Vehicle utilization "targets" are intended to provide a measurement of equipment utilization and are not hard performance standards.

6-2. Technical Coordination. The program is to be technically coordinated by the EFD's (TEMC's) for claimants as applicable.

6-3. Applicability. The automotive/construction equipment utilization program is applicable to all naval shore activities. The program does not apply to the advanced base and tactical units. Activity Utilization Report (Figure 6-1) will be used for activity quarterly internal records (see paragraph 6-8).

6-4. Equipment Subject to the Program. Navy owned or leased administrative use motor vehicles, construction, railway, and weight handling equipment at naval shore activities are subject to the program. The types of equipment are listed in Appendix G under Alpha Code groups A through N (less Alpha Code group F) and Alpha Code groups S, U, W, and Y. These types are to be included in the utilization program and reported in the annual submission of NAVFAC Form 11200/28, Annual Allowance and Requirements Review. A general summary of equipment grouping for utilization reporting is shown in paragraph 6-9.

6-5. Equipment Excluded from Program. Special purpose vehicles, as defined in Appendix A, are excluded from the program. Administrative use vehicles are not to be excluded from the utilization program because of assignment to special use. Examples of special use are pickup trucks assigned to station fire departments, or trucks modified with temporary installation of racks to facilitate handling certain types of cargo or to provide services, such as tire service trucks with small mounted air compressors, tractor trucks used with aviation gasoline (AVGAS) trailers, etc. Equipment classified in Alpha Code Groups F, P, Q, R, T, V, X, and Z are excluded from the program.

6-6. Formula for Utilization Reporting. The standard utilization percentage for all Alpha Groups reporting utilization performance is 100. Ideally, the actual utilization percentage should be the same as, or more than, the standard utilization percentage. When computing the utilization percentage, "Total Actual Period Miles/Hours" is the mileage/hours generated by the activity equipment assignments. The Total Target Period Mileage/Hours is the sum of target miles/hours per unit multiplied by the average inventory for the reporting period:

ACTIVITY UTILIZATION REPORT

REPORT DATE: 1120-17

ACTIVITY: Naval Station, U.S.A.

ALPHA CODE	DESCRIPTION	ANNUAL TARGET MILES PER UNIT	1ST QUARTER			2ND QUARTER			3RD QUARTER			ANNUAL			REQUIRE'S FUEL, A/TION
			FY ACTUAL USE	% OF B.G. INV	END USE	FY ACTUAL USE	% OF B.G. INV	END USE	FY ACTUAL USE	% OF B.G. INV	END USE	FY ACTUAL USE	% OF B.G. INV	END USE	
1	?	3	4	5	6	7	8	9	10	11	12	13	14	15	21
A	Sedan	10000	10	25000	94	10	10	50000	93	10	10	75000	97	10	10
B	Bus, 37 Passenger	16000	5	21350	107	5	5	40950	102	5	5	59550	98	5	5
C/	Pickups	10500	50	13400	104	50	50	261700	100	50	50	393750	98	50	50
E/	Trucks, Stake & Dump	7700	29	53825	95	29	29	111650	94	29	29	16773	94	29	29
Etc.	(A thru N less F)	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ACTIVITY REPORT - INCLUDES ALL VEHICLES ASSIGNED TO THE ACTIVITY														...	
Mileage dropped substantially after 1st quarter. Analysis to determine reason for mileage drop should have been made at the end of the second quarter's reporting period.														...	
2/ Indicates that vehicles are not being used as much as during previous year. Analysis of all assignments should have been made after the 1st and 2nd quarters to determine which vehicles are not meeting assigned targets. The department/division utilization report will pin point low mileage vehicles.														...	
SHEET OR														...	

Figure 6-1 NAVFAC Form 11240/9, Activity Utilization Report

Total Actual Period Miles/Hours (Alpha Group) = Utilization Percentage
Total Target Period Miles/Hours (Alpha Group)

To compute the utilization inventory, use the following formula:

Total Validated Miles/Hours During Report Period (Alpha Group) =
Target Mileage/Hours Per Unit (Alpha Group)

Allowed Utilization Inventory (should not be less than the average inventory and approved allowance).

6.7. NAVFACENGCOM EFD (TEMC) Technical Assistance. The appropriate EFD (TEMC) shall provide assistance in making a detailed evaluation of the activity's equipment requirements, by using the activity's latest approved allowance and by reviewing and validating Class B assignments during the annual activity transportation assistance visits. Upon completion of allowance review/validation and concurrence in activity Class B assignments, targets will be established for all equipment subject to the utilization program by Alpha Group for the activity. Using the on-hand inventory list, the past 12 months miles/ hours are computed for each Alpha Group. The total Alpha Group miles/hours for the equipment are then divided by the number of assignments. The amount derived is the activity miles/hours target per unit of equipment within the Alpha Group. Rapid changes in activity tempo affecting established targets should be reported to the TEMC for necessary target adjustment to ensure realistic utilization data on the NAVFACENGCOM Report 11200/28 (see NAVFACINST 11200.12, Annual Allowance/Requirements Review).

6-8. Activity Utilization Report NAVFAC 9-11240/9. The Activity Utilization Report (Figure 6-1) is designed to keep activity management informed of transportation equipment utilization. When developing the annual target miles/ hours by quarters, a straight line projection may be used. However, due to variation in amount of usage caused by weather, seasonal workload changes, or other operating conditions the activity may desire to vary the quarterly targets, taking into account low and high utilization periods as accurately as possible. Variable quarterly targets could provide a more meaningful usage comparison. In any event, the total of the quarterly projections must equal the established annual target. This form is to be filled out for each activity for the total Alpha Group. The form is made up of the following data:

a. Column 1--Alpha Group. Enter standard equipment utilization Alpha Group Code A-N (less Alpha F) and S, U, W, and Y or Equipment Code as appropriate.

b. Column 2--Description. Enter type of equipment, e.g., sedans, buses, railroad, etc., assigned to the activity.

c. Column 3--Annual Target Miles/Hours Per Unit. Enter established annual target miles/hours per unit for the Alpha Group.

d. Column 4--Fiscal Year Beginning Inventory. Enter the number of equipments on hand at the activity within the applicable group.

e. Column 5

(1) Target Miles/Hours. Enter estimated target figure for the first quarter, fiscal year. Usually this figure is determined by using 25 percent of the miles/ hours per unit figure set forth in column 3 multiplied by the inventory (column 4). This method is a guideline since variation may occur because of quarterly fluctuating workloads. Varied target miles/hours by the quarter, based on usage experience, may be used when preparing the utilization report.

(2) Actual Miles/Hours. Enter actual miles/hours operated by validated equipment assignments in the group during the quarter. This figure is obtained from odometer/hour meter readings or miles/hours reports. Actual miles/hours operated must be entered at the close of the quarter in order that utilization and assignment of the vehicles may be promptly evaluated.

f. Column 6--Percentage of Use. Enter percentage figure obtained by dividing target miles/hours into actual miles/hours operated by validated assignments.

g. Column 7--Average Inventory. Enter figure obtained by dividing the sum of columns 4 and 8 by two.

h. Column 8--Ending Inventory. Enter number of vehicles on hand by group at the end of the first quarter. The inventory will include only the number of equipments assigned and in use. Example: If three replacement vehicles were received, these would not be recorded in the ending inventory in addition to those in service; the ending inventory for utilization purposes should not increase due to the fact that the old vehicles came out of service as the new ones went into service.

i. Column 9.

(1) Target Miles/Hours. Enter the total of the first and second quarter estimated miles/hours for all vehicles in the group. The procedure described for determining column 5 first quarter may be used, except in this quarter 50 percent of the miles/hours per unit figure set forth in column 3 is multiplied by column 7 unless variable quarterly targets are used.

(2) Actual Miles/Hours. Enter the total of actual miles/hours traveled during the first and second quarter for all equipment assignments in the group. This figure is obtained from odometer/hour meter readings or miles/hours reports.

j. Column 10--Percentage of Use. Repeat column 6 procedure.

k. Column 11--Average Inventory. Enter figure obtained by dividing total of columns 4, 8, and 12 by three.

1. Column 12--Ending Inventory. Enter number of equipment on hand by group at end of second quarter. (Column 8 comments are applicable for determining equipment ending inventory.)

m. Column 13

(1) Target Miles/Hours. Enter the total of the first, second, and third quarter estimated miles/hours for all equipment in the group. The procedure described for determining column 5 first quarter may be used, except in this quarter 75 percent of the miles/hours per unit figure set forth in column 3 is multiplied by column 11 unless variable quarterly targets are used.

(2) Actual Miles/Hours. Enter the total of the miles/hours traveled during the first, second, and third quarter for all validated equipment assignments in the group. This figure is obtained from odometer/hour readings or miles/hours reports.

n. Column 14--Percentage of Use. Repeat column 6 procedure.

o. Column 15--Average Inventory. Enter figure obtained by dividing columns 4, 8, 12, and 16 by four.

p. Column 16--Ending Inventory. Enter number of equipment items on hand by group at end of third quarter. (Column 8 comments are applicable for determining vehicle ending inventory.)

q. Column 17

(1) Target Miles/Hours. Enter the total fiscal year estimated miles/hours for all equipment in the group. The procedure described for determining column 5 first quarter may be used, except in this quarter 100 percent of the miles/hours per unit figure set forth in column 3 is multiplied by column 15.

(2) Actual Miles/Hours. Enter actual total miles/hours operated during the fiscal year.

r. Column 18--Percentage of Use. Repeat column 6 procedure.

s. Column 19--Average Inventory. Enter figure obtained by dividing the total of columns 4, 8, 12, 16, and 20 by five.

t. Column 20--Ending Inventory. Enter number of vehicles/equipments on hand at end of fiscal year. (Column 8 comments are applicable for determining vehicle/equipment ending inventory.)

u. Column 21--Requires Evaluation. Divide the annual target miles/hours per unit (column 3) into the actual miles/hours operated by assignments (column 17). If the number obtained is less than the average annual inventory (column 19), subtract and show the balance as a plus (+) in column 21. Assignments for this group should be evaluated to determine cause of decreased usage. If the number obtained is greater than the average annual inventory, subtract the average annual inventory from this amount and show

balance as a minus (-). The resultant of the calculation should be compared to the following table to determine the allowable inventory:

Resultant	Allowable Inventory
0.1-1.0	1
1.1-2.0	2
2.1-3.0	3
etc.	etc.

6-9. Equipment Groupings for Utilization Reporting

AUTOMOTIVE

<u>Group</u>	<u>Description</u>
A	Sedans
B	Bus--BOC--37 passengers or under
C	Bus--BOC--38 passengers or over
D	Bus--Integral
E	Station Wagon
G	Truck--1/2 Ton--Pickup
H	Panels--Carryalls--Truck 1/4-3/4 Ton
I	Truck & Truck Tractor--1 Ton
J	Truck & Truck Tractor--1 1/2-2 Ton
K	Truck & Truck Tractor--2 1/2 Ton
L	Truck & Truck Tractor--3-4 Ton
M	Truck & Truck Tractor--5-10 Ton
N	Truck & Truck Tractor--11 Ton and over

CONSTRUCTION

S	Construction (Utilization required)
U	Ground Maintenance Equipment
W	Powered Railway Equipment
Y	Weight Handling Equipment

6-10. Reporting--External. Utilization percentage will be computed as follows for reporting on the Annual Allowance and Requirements Review NAVFAC Form 11200/28: Multiply target miles/hours per unit by on-hand inventory (column 3c) to obtain the total target miles/hours. Divide miles/hours operated by assignments (present allowance column 3a), by the total computed above. The percentage will be entered in column 3b, to the nearest whole figures, e.g., 95, 115, etc.

6-11. Evaluating Reports. The activity will evaluate usage by equipment code on its equipment through use of the Activity Utilization Report (NAVFAC Form 11240/9). This evaluation is to be made quarterly by the transportation management personnel. When it is found that activity usage performance has decreased by 10 percent of established target, investigation should be made into the cause of the change. Results of this investigation, with recommendations for correction if there is a problem, should be furnished to the appropriate activity officials for their action.

6-12. Unusual Conditions. Unusual operating conditions experienced at an activity over a given period of time may cause utilization for certain types of equipment to fall below the standards. Rather than look to readjustment of targets, activities shall examine every aspect of the conditions affecting their transportation operations and take whatever measures are possible to alleviate the condition. Such measures shall provide the minimum quantities of vehicles needed to maintain essential transportation services. Suggestions to guide activity personnel in analyzing and improving special conditions or situations are contained in chapter 12 of this publication. Maximum pooling of equipment assets is to be effected to the fullest extent practicable.

6-13. Customer Notification of Equipment Utilization Performance. Activities that provide transportation equipment on a reimbursable and full-time basis (PWC's and lead activities) will prepare a report of equipment utilization for each customer quarterly (cumulative year to date) based on these procedures. PWC's and lead activities shall make concerted efforts to obtain maximum utilization performance and maintain control over their corresponding inventories and allowances levels by encouraging customer activities to restrict requests for equipment assignments to the minimum essential for the accomplishment of their respective missions. The appropriate EFD has responsibility for reviewing such assignments and recommending to user activity reductions in rentals/ assignments when applicable.

CHAPTER 7. GUIDELINES FOR ACHIEVING MOTOR VEHICLE FUEL ECONOMY

7-1. Vehicle Usage Reduction. Vehicle usage should be reduced to that essential to mission accomplishment. Walking and use of bicycles should be encouraged where appropriate. The most fuel efficient mode of transportation consistent with total cost effectiveness should be employed, considering the following.

a. Bus Systems. Maximize use of scheduled bus systems where economically feasible and justified by passenger density.

b. Pooling. Maximize vehicle pooling. Establish pickup points and follow the practice of every Navy vehicle operating where practicable with a full payload of passengers and/or cargo.

c. Taxi Service. Where economically feasible, establish a radio-dispatched base taxi (feeder system) employing passenger vans for multiple random-passenger transport to connect with or supplement the regularly scheduled bus routes.

7-2. Maintain Vehicle in Fuel Efficient Condition. To achieve maximum fuel economy, the vehicle engine must efficiently convert the fuel into horsepower. This power in turn must be efficiently transmitted through the drive train to the wheels. Finally, the vehicle must roll freely on the road. The following maintenance actions must be taken to ensure the total vehicle is maintained to achieve the top fuel efficiency for which it was designed.

a. Emission Inspection and Maintenance

(1) Under the Clean Air Act, as amended, the DoD is required to comply with state and local programs to improve air quality. All DoD Components shall conform with the state and local standards to monitor and analyze emissions from commercial vehicles and shall utilize state and local guidelines in conducting such analyses.

(2) Section 203 of the Clean Air Act also prohibits DoD personnel or Contractors from removing or rendering inoperative any emission control device or element of design. The civil penalty for violation of this provision is \$2500.00 per vehicle. Violations of the unleaded fuels regulations can result in penalties of up to \$10,000 per violation. When performing corrective adjustments and repair actions or tuneups, engine settings shall not be accomplished outside of the manufacturer's recommended specifications, nor shall pollution control related equipment such as the catalytic converter, exhaust gas recirculation valve, or heated air intake system be removed or rendered inoperative.

b. Engine. Tune engine every 12,000 miles or 12 months to manufacturer's recommended specifications, using modern diagnostic and test equipment. Especially check to ensure that the following systems and components are functioning correctly.

- (1) Ignition timing
- (2) Emission system
- (3) Automatic choke is fully released when engine is warm
- (4) Exhaust system is unrestricted
- (5) Air cleaner is unrestricted
- (6) Thermostat is closing/opening at specified coolant temperatures

c. Power Train Chassis, Wheels/Tires. Abnormal power train and chassis friction and other rolling resistance requires excessive fuel consumption which can be eliminated or reduced by the following actions.

- (1) Adjust service and parking brakes to ensure there is no drag
- (2) Adjust wheel bearings to proper torque rating
- (3) Check wheel alignment to ensure proper camber, castor, and toe-in
- (4) Inspect springs and spring hangers to ensure vehicle is tracking correctly
- (5) Inspect motor and transmission mounts and drive shaft to ensure drive train is not distorted
- (6) Lubricate chassis at frequencies recommended by manufacturer
- (7) Maintain cold tire pressure at 5 to 10 pounds above specifications, not to exceed manufacturer's maximum pressure, as a means of reducing rolling resistance

7-3. Operate Vehicle in Fuel Efficient Manner. The final but most important factor in achieving maximum fuel economy is operating the vehicle in a fuel efficient manner. Studies have shown that the average motor vehicle, operated in the fuel efficient manner, can achieve at least 20 percent more miles per gallon (mpg) than one operated in a normal manner. Motor vehicle operators should be instructed in the following fuel efficient methods to determine when the vehicle requires maintenance to achieve fuel efficiency.

a. Ensure that the vehicle is the minimum weight and size for the pay-load. Remove unnecessary loads, but carry maximum payloads. Moving the total vehicle weight and its load accounts for 80 percent of the fuel consumed.

b. Plan and schedule trips to reduce the distance traveled, but avoid idling in heavy traffic.

c. Avoid prolonged engine warmup.

d. Accelerate slowly. Allow automatic transmission to shift into high range by easing off accelerator as soon as possible. With a manual transmission, shift into high gear as soon as possible without luggering engine. High speed starts should be avoided.

e. Drive at a steady speed. Anticipate needs for a slower or faster speed to avoid rapid acceleration and braking, as both operations waste fuel. Braking dissipates energy in the form of waste heat.

f. Reduce top vehicle speed to that really necessary. Normally, the best fuel economy is achieved with the transmission in high gear at speeds between 30 and 40 miles per hour (mph). Wind resistance at speeds in excess of 40 mph results in a significant increase in fuel consumption.

g. Eliminate engine idling while waiting.

h. Limit use of electrical accessories. Turn off lights and heater when not needed.

i. Limit use of air-conditioner. This accessory alone reduces the miles per gallon (mpg) 10 percent below that achievable without its use.

CHAPTER 8. REGISTRATION AND TECHNICAL RECORD CONTROL

8-1. Responsibilities. The responsibility for assigning USN registration numbers to automotive vehicles, construction equipment, weight handling equipment, and standardized automotive components of specialized types has been assigned to NAVFACENGCOM. The responsibility for maintaining current and complete files and records for all naval activities' transportation equipment ashore and afloat has also been so assigned.

8-2. Purpose of Registration. The principal purpose of registering appropriate items of transportation equipment is to establish permanent and positive identification of each transportation equipment unit that comes under the categories shown in Table 8-1. This is done by assigning a permanent U.S. Navy registration number to each unit of equipment at the time of its acquisition by the Navy.

8-3. Classification by Registration Number. The U.S. Navy registration number assigned to each unit of equipment is keyed to classify the unit by the pertinent subcategory within one of the eight major categories of transportation equipment. Table 8-1 shows an outline of the classification system. Appendices C and G of this publication specify the appropriate items of transportation equipment that require registration.

8-4. Initial Registration at the Factory. As a part of the procurement contract, the manufacturer is required to identify applicable vehicles or equipments by U.S. Navy registration numbers painted on the equipment and die-stamped on the nameplates. In addition, short standard nomenclatures describing the equipments are etched or die-stamped on the nameplates for guidance of field personnel. Expanded Material Inspection and Receiving Reports, Form DD 250, are prepared by the manufacturer for each equipment. The Government inspector is responsible for supervising the preparation of the form. Initial registration provides a means of identifying each piece of equipment on record in a uniform manner from the time of purchase until final disposition from the U.S. Navy. A copy of the completed DD 250 will be furnished with the shipping document to the consignee for insertion in the history record jacket. One copy will be forwarded to the Naval Construction Battalion Center (CBC), Port Hueneme, CA (Code 15). CBC Port Hueneme will reproduce the DD 250 and forward one copy to the Commanding Officer, Navy Ships Parts Control Center (SPCC), Mechanicsburg, PA, as may be necessary for parts and integrated logistics support purposes, and one copy to the appropriate EFD (TEMC).

8-5. Initial Registration at the Activity.

a. Unidentified Items. When an activity receives an item of transportation equipment that is not identified by a permanent U.S. Navy registration number but which requires one under the criteria in paragraph 8-2 preceding, a request for a registration number should be made immediately. The custodian of the item received shall initiate the request by preparing the DOD Property Record, Form DD 1342, in accordance with subparagraph c following. The DD 1342 requesting the assignment of the U.S. Navy registration number is to be forwarded to CBC Port Hueneme via the appropriate EFD (TEMC).

b. Registration Number Assignments. CBC Port Hueneme will assign a U.S. Navy registration number to the unit concerned and will enter this number on

Table 8-1
Classification of Equipment by Assignment of Permanent USN
Registration Numbers

Registration Series	Category
USN 20-00000	Crushing, Mixing, Batching and Paving Equipment
21-00000	Batchers
22-00000	Crushing, Washing, and Screening Equipment
23-00000	Finishers
24-00000	Mixers
25-00000	Distributors and Placers
26-00000	Spreaders and Transporters
27-00000	Asphalt Equipment (Miscellaneous)
28-00000	Concrete Equipment (Miscellaneous)
USN 30-00000	Drilling, Blasting, and Driving Equipment
31-00000	Compressors, Air, Portable (60 through 600 cu. ft./min.)
35-00000	Rock Drilling Equipment
36-00000	Pile Drivers
37-00000	Well Drilling and Earth Boring Equipment
USN 40-00000	Earth Moving Equipment
42-00000	Crane, Crawler, Revolving, w/Backhoe, Dragline, Shovel, and Skimmer Attachments
43-00000	Ditchers, Rooters, and Mucking Machines
44-00000	Graders
45-00000	Loaders
46-00000	Rollers
47-00000	Earth and Rock Moving Equipment, Off Highway Trucks, Trailers, and Scrapers
48-00000	Tractors
USN 50-00000	Power Generation and Miscellaneous Construction and Main- tenance
	Equipment
51-00000	Generators (5 KW and up); Welders, Electric Arc; Lighting Equipment, Trailer Mounted
52-00000	Pump, Water, Centrifugal or Diaphragm, Portable, 4-inch to 12-inch capacity, Gas or Diesel
53-00000	Pump, Special Construction and Asphalt, Portable
54-00000	Servicing Equipment (Miscellaneous)
55-00000	Portable Power Operated Pipe Tongs, Amphibious Fueling Hose Reel, and Skid Mounted Air-Conditioning Unit
56-00000	Soil Stabilizing and Lawn Equipment
57-00000	Sweepers, Snowplows, Snowplow Attachments, and Sanders
58-00000	Trash and Garbage Collectors
59-00000	Mobile Machine Shops

Table 8-1 (Continued)
 Classification of Equipment by Assignment of Permanent USN
 Registration Numbers

Registration Series	Category
<u>USN 60-00000</u>	Railway Equipment (Except Locomotive Cranes)
61-00000	Car, Railway, Hauling
62-00000	Car, Railway, Self-Propelled
63-00000	Car, Railway, Special Purpose
64-00000	Car, Railway, Tank
65-00000	Locomotive, Railway
66-00000	Equipment, Railway, Track Maintenance
67-00000	Car, Railway, Power Generating
68-00000	Station, Railway, Mobile Power
<u>USN 70-00000</u>	Firefighting Equipment
71-00000	Fire Truck, Crash, and Rescue
72-00000	Pump, Fire, Portable
73-00000	Fire Truck, Pumper Combination
74-00000	Truck, Fire Aerial Ladder
75-00000	Generator Foam, Trailer Mounted
<u>USN 80-00000</u>	Weight Handling Equipment
81-00000	Crane, Tractor Mounted or Operated, and Landing Craft, Wheel Mounted
82-00000	Crane, Truck, and Missile-Handling
83-00000	Crane, Floating, and Pile Driver, Floating
84-00000	Crane, Railway, Locomotive
87-00000	Hoist and Winch Power
88-00000	Propelling or Propulsion Unit, Marine Type
89-00000	Oil Spill Equipment
<u>USN 90-00000</u>	Passenger Vehicles, Trucks, and Trailers
91-00000	Bus
92-00000	Sedan
93-00000	Station Wagon
94-00000	Truck, Light (up to 9,999 GVW)
95-00000	Truck, Medium (10,000 up to 18,999 GVW)
96-00000	Truck, Heavy (Over 19,000 GVW)
97-00000	Trailer
98-00000	Motorcycle and Scooter

all copies of the DD 1342. One copy of the DD 1342 will be returned directly to the custodian. A copy of the forwarding correspondence, with DD 1342, will be sent to the appropriate EFD (TEMC) for followup purposes. In case an activity is not supported by an EFD (TEMC), one copy of DD 1342 will be forwarded directly to the activity. This copy is to be inserted in the activity transportation equipment jacket for the unit concerned. The custodian of the equipment shall affix the assigned U.S. Navy registration number on the unit in accordance with the lettering instructions contained in Chapter 25 of this publication.

c. Property Record. The DOD Property Record (DD 1342) will be used to report acquisition and transfers of all CESE in support of the Navy's registration system. The need for accurate preparation of the DD 1342 cannot be overemphasized because this document is the sole source for recording all pertinent data relative to the equipment. Instructions for the preparation of the DD 1342 are contained in the NAVCOMPT Manual, Volume 3, chapter 6. Problems or questions regarding preparation of DD 1342 should be directed to the cognizant EFD (TEMC).

8-6. Report Symbol. Report Symbols OMB 22 R0403 and OMB 22 R209 apply to the reports required from the registration and technical record control system.

8-7. Registration of Motorized Mounted Equipment.

a. Registration of Truck Mounted Equipment. Plant property items mounted on automotive vehicles in such a manner as to be termed an auxiliary item (removal from the vehicle would incapacitate the item) will be reported as an auxiliary item to the vehicle on which mounted. Individual property record cards will not be prepared for accessory and auxiliary equipment items that are attached to or are otherwise made a part of a plant property item; however, the description of such accessory or auxiliary equipment will be entered on the respective property record card and the cost of the item increased accordingly. If the accessory or auxiliary equipment is reassigned to another equipment item, the respective DD Form 1342 will be updated to disclose the transfer and to record the changes. However, if the item can be used as a separate unit when removed from the vehicle, both items will be reported as individual items of equipment. A notation will be included on the equipment cards to indicate that the item is mounted on an automotive vehicle or trailer and a cross reference will be made to the automotive vehicle or trailer card.

b. Registration of Hired Vehicles. Automotive vehicles hired or leased for a period of 60 days or more are required by law to be identified as Navy vehicles. Registration numbers in the USN 500,000 series have been set aside to identify vehicles leased from commercial sources. Government-owned vehicles hired from GSA will be identified by a GSA seven digit number with a prefix of "G." The DD 1342 will be prepared and distributed to CBC Port Hueneme (Code 15) via the appropriate EFD (TEMC) by each activity assigned the hired vehicles.

8-8. Special Vehicle Registration, National Capital Region. The special program for registration (including Government tags), inspection, and licensing of Navy motor vehicles regularly based or housed in the District of Columbia will be coordinated by the Chesapeake Division, NAVFACENGCOM.

8-9. Special Vehicle Registration Records. The EFD's (TEMC's) shall maintain a current record of special official Government tags and State tags in use on Navy-owned motor vehicles within the area of technical support. Such reports will describe the motor vehicle by type and U.S. Navy registration number, cross-referenced to the special tag numbers, and will include information regarding all subsequent reassessments of tags and voided tag numbers.

8-10. Nonappropriated Fund Vehicle Registration. EFD's (TEMC's) will ensure that nonappropriated fund activities are instructed that all transportation equipment received from excess sources or by procurement will be registered in the 400,000 series of USN registration numbers. The legend "For Official Use Only" will not appear. However, the name of the using unit (i.e., Navy Exchange, etc.) will be identified on the vehicle. To obtain USN registration numbers, the DD 1342 will be prepared by the receiving activity and forwarded to CBC Port Hueneme (Code 15).

8-11. Registration of Interchange Service Railroad Cars

a. Railway Cars To Be Included. Activities with railroad cars that were previously identified under the reporting marks "USNX" but no longer appear in the current Official Railway Equipment Register are to request U.S. Navy registration numbers in the 60-00000 registration series. All USN 60-00000 registration series cars are to be included in the Technical Record Control System.

b. Railway Cars To Be Excluded. The railway cars listed in the current Official Railway Equipment Register for interchange service and identified under the reporting marks "USNX" are not to be included in the Technical Record Control System.

8-12. Alteration and Conversion Records. A new DD 1342 will be prepared by the holding activity whenever an item of transportation equipment is altered by a change in the type of body, addition of a body to a chassis, or other conversion. The word "ALTERED" must be noted on the face of the DD 1342, and the full details of the alteration or conversion must be described thereon. The custodian of the equipment will retain one copy of the DD 1342 (showing the alteration or conversion) in the equipment jacket files, forward two copies to CBC Port Hueneme (Code 15) via the appropriate EFD (TEMC). Ships Parts Control Center, Mechanicsburg, PA, will be advised of all vehicle and equipment alterations and conversions.

CHAPTER 9. PROCEDURES FOR REPORTING ACQUISITION OF REGISTERED TRANSPORTATION EQUIPMENT UNDER THE TECHNICAL RECORD CONTROL SYSTEM

9-1. Property Record Card Application. The DOD Property Record, Form DD 1342, is applicable to all naval shore activities for reporting receipt of equipment. Equipment at Fleet type activities in Area Numerical Code Designators 80 and 97 (see Table 9-1) will be accounted for by the Commander, Atlantic Division, NAVFACENGCOM. Equipment at similar activities in Area Numerical Code Designators 90 and 98 will be accounted for by the Commander, Pacific Division, NAVFACENGCOM.

9-2. Property Record Card Preparation. Instructions for preparation and distribution of Form DD 1342 are described in the NAVCOMPT Manual, Volume 3, Chapter 6, Section II. Applicable Area Numerical Code Designators are shown in Table 9-1. The Area Numerical Code Designator is to be entered in Block 54 of the DD 1342.

9-3. Property Record Card Processing. Upon receipt of a DD 1342 from an activity, the EFD (TEMC) will report acquisition or disposition, as appropriate, of the equipment to CBC, Port Hueneme (Code 15). The method of reporting equipment at naval shore activities and at Area Numerical Code Designators 80, 90, 97, and 98 is outlined in the following paragraphs.

9-4. Report of Transportation Equipment Acquisition by EFD's (TEMC's).

a. Location. The transportation equipment technical records are included in the Construction, Automotive, and Specialized Equipment/Management Information System (CASE/MIS), which is maintained by CBC, Port Hueneme (NAVFACENGCOM Systems Office (FACSO)).

b. Review of Form DD 1342. The TEMC's will review each DD 1342 received from the activities for accuracy and completeness of data.

c. Reporting. Upon completion of the review, the TEMC will mail the DD 1342 to CBC Port Hueneme (Code 15) or, if authorized, transmit the data from the DD1342 to CBC Port Hueneme (Code 18 - FACSO) via the remote job entry (RJE) computer terminal, using the acceptable CASE/MIS change sheet punched card form 11ND-CBC-5236/26 (1-75); reports will be processed in accordance with CBC, Port Hueneme CASE/MIS Desk Procedures.

(1) Reporting by Mail

(a) The TEMC will mail the DD 1342 with endorsement to CBC Port Hueneme (Code 15).

(b) CBC, Port Hueneme (Code 15) prepares and forwards an equipment identification load sheet to the computer to register the equipment in the CASE/MIS master equipment file.

(c) Computer support personnel will keypunch the acquisition date, update the CASE/MIS master file, and forward an updated FACSO Report Symbol No. 4440/B222AR01 and 4440/B2240R01 (if any errors occur) to the TEMC.

Table 9-1
Area Numerical Code Designators

Naval District/ Area Code	Naval District/Area
04	Commander, Naval Base, Philadelphia
05	Commander, Naval Base, Norfolk, Virginia
06	Commander, Naval Base, Charleston, South Carolina
08	Chief of Naval Reserve
11	Commander, Naval Base, San Diego, California
13	Commander, Naval Base, Seattle, Washington
14	CINCPACFLT
21	Naval District, Washington
30	Atlantic Area
31	European Area
40	Pacific Area
<p>All Navy School of Construction (NAVSCOLCONST), Construction Training Units (CONSTRAU), and Construction Battalion Units (CBU) activities are to be excluded. For management purposes, pseudo-Naval District/Area Codes may be displayed on various Construction, Automotive, and Specialized Equipment /Management Information System (CASE/MIS) output reports for automotive and construction equipment assigned to activities in the following classes:</p>	
45	Chief, Naval Education and Training (CNET) Activities.
80	For Fleet type and independent activities in the Atlantic Area that are not listed in the Catalog of Naval Shore Activities, OPNAV P-09B2-105. Naval Construction Force supported activities are excluded.
90	For Fleet type and independent activities in the Pacific Area that are not listed in the Catalog of Shore Activities, OPNAV P-09B2- 105. Naval Construction Force supported activities are excluded.
97	For ships in the Atlantic Area.
98	For ships in the Pacific Area.

(d) The TEMC will ensure that all errors shown on the B2240R01 report are reconciled and resubmitted to FACSO for keypunching.

(e) The TEMC's and CBC, Port Hueneme (Code 15)/(Code 18) will continue to follow weekly the procedures outlined in the preceding sub-paragraphs for all DD 1342's submitted by mail.

(2) Reporting by Remote Job Entry (RJE).

(a) The TEMC will transfer the data from the DD 1342 to punched cards by using the CASE/MIS change sheet format (see paragraph 9-4.c.), then forward the data to CBC, Port Hueneme (Code 18) via the RJE terminal. A copy of the DD 1342 will be sent to CBC, Port Hueneme (Code 15) stamped "For Information Only."

(b) CBC Port Hueneme (Code 18) will update the CASE/MIS master file and forward an updated FACSO Report Symbol No. 4440/B222AR01 and 4440/B2240R01 (if any errors occur) to the TEMC.

(c) The TEMC will ensure that all errors shown on the B2240R01 report are reconciled and resubmitted to FACSO.

(d) The TEMC's and CBC Port Hueneme (Code 18) will continue to follow weekly the procedures outlined above for all RJE transmissions.

d. Program Summary Reports. CBC Port Hueneme (Code 18) will prepare and forward the following reports to each TEMC:

(1) FACSO RPT SYM/No 4440/B222AR01 "Construction, Automotive, and Specialized Management Information System Registration Report--Navy-wide inventory listing by USN registration numbers."

(2) FACSO RPT SYM/No 4440/B2240R01 "Construction, Automotive, and Specialized Management Information System Edit and Update Error Report--comprehensive error listing of all transactions submitted for updating the master file."

CHAPTER 10. TRANSPORTATION EQUIPMENT REPLACEMENT CRITERIA

10-1. Life Expectancies. Age or mileage expectancies furnished in Appendix C are to be used when considering Civil Engineering Support Equipment (CESE) for replacement or for overhaul and retention. The age eligibility and mileage expectancies applicable to automotive vehicles have been derived from administrative use motor vehicle replacement criteria published by DOD for use by all military departments. The tables have been prepared from the criteria for application to all vehicles in Navy use, including such vehicle chassis as may be used for specialized type vehicles. The tables should not be used for specialized type equipment mounted on the vehicle. Age expectancies of construction, railway, and weight handling equipment shown in Appendix C are to be used to determine the basic zone of eligibility; these age expectancies do not have the same value as the age tables for automotive vehicles. Construction, railway, and weight handling equipment has a considerably lower use rate and is not as affected by age as automotive vehicles. Undependability, obsolescence, and major repair costs are the prime considerations for replacement of such equipment.

10-2. Replacement Planning and Programming--Automotive Vehicles.

a. Replacement. Replacement of automotive vehicles must be planned and programmed in the budget year requirements program as prescribed in NAVFACINST 11200.12 (current edition). Replacement vehicles will not be automatically or immediately provided when eligibility is obtained. The criteria in Appendix C provide a systematic and uniform schedule of eligibilities for planning the replacement program. As a practical matter, there is only one annual procurement cycle after approval of the budget and release of appropriations. Application of the criteria in Appendix C must be within the framework and timing of the normal cycle. Statistical vehicle fleet average should be used in projecting mileage and extensive repair costs in the budget year requirements estimate.

b. Repair and Replacement Determinations--Automotive Vehicles. In addition to the age or mileage eligibility (Appendix C), a vehicle is eligible for replacement when the cost of repairs exceeds certain limits. Normally, repairs will not be accomplished when the cost of repair exceeds 50 percent of the present replacement value of the vehicle as determined from computation factors provided in Appendix C. If a replacement vehicle is not immediately available, repairs necessary to ensure that the vehicle is maintained in a safe and reliable condition may be accomplished until a replacement vehicle is available.

10-3. Costing of Repair Estimates--Transportation Equipment. Uniform cost criteria should be used to determine whether it will be more economical to repair or replace transportation equipment (see Appendix H for cost standards). Repair estimates shall include the following elements of cost.

- (1) Direct labor
- (2) Direct material

(3) Indirect expenses

(4) Other direct charges

a. Direct Labor. Direct labor is that labor, either civilian or military, which can be specifically identified to the repair job.

(1) In order to arrive at direct labor cost, it is necessary to determine the direct labor man-hours required, and then to apply the appropriate direct labor hourly rates to these man-hours; this determines the direct labor cost.

(2) Direct labor costs must represent the best available estimate. Where appropriate, activities may prescribe the use of flat rate manuals for determination of the direct labor man-hours required. Otherwise, estimates will be based on similar work performed previously, or estimates based on individual experience.

b. Labor Rates for Civilian Employees. Cost of civilian labor will be based on a labor rate for the work center performing the work as follows.

(1) When costs of civilian labor are determined on the basis of annual salaries, these costs will be computed by adding to the gross pay, as shown in current pay tables, the factor for Government-contributed benefits.

(2) When costs of civilian labor are determined on the basis of direct labor hours (days, etc.) applied, these costs will be computed by adding to the gross pay, as shown in current pay tables, the factor for Government-contributed benefits.

c. Labor Rates for Military Personnel. Labor rates for military personnel will be the average military wage rate for the work center performing the work, based on standard rates published in the NAVCOMPT Manual, Volume 3, Chapter 5.

d. Direct Materials.

(1) Cost to repair will include all materials directly applied and identifiable to the particular material undergoing repair, including Government-furnished materials to be consumed by a contractor in performing all or a part of the maintenance job.

(2) Consumable items received from the supply system will be costed at the standard inventory price. Items procured from local services will be priced at the latest invoice cost including transportation. Fabricated items will be priced at actual cost including direct expenses as defined herein.

(3) Components and assemblies used in the repair process will be costed at the exchange price, representing the standard inventory price less credit for the return of unserviceable repairable components removed. The exchange price may be established as a percentage of the standard inventory price as long as it reflects the estimated cost to repair.

e. Indirect Expenses.

(1) The cost estimate will include indirect expenses associated with the repair process, which will be determined by applying the indirect expense rate (expressed as dollar cost per direct labor man-hour) to the estimated direct labor man-hours.

(2) The indirect or overhead costs included in the indirect expense rate shall include: manufacturing or production expense (indirect cost incurred within or identifiable to the maintenance shop or organization performing the repair work, although not identifiable to particular jobs); and, general and administrative expenses--costs incurred in general management or supervision which are measurable costs chargeable to maintenance activities.

f. Other Charges.

(1) Contractual Services required incident to and identifiable with the performance of all or a portion of the specific maintenance job will be included as an element of cost. If the contractor is to perform a significant portion of the maintenance job, the cost estimate will show the projected charges for labor and contractor-furnished parts in addition to the total contract price.

(2) Readyng for Shipment. Where the material cannot be repaired on site and costs must be incurred to prepare the item for shipment regardless of destination, such costs are to be included in the estimate of cost to repair.

(3) Other. Any other charges required to accomplish the required maintenance and directly identifiable to the material will be included, although not specifically mentioned herein.

(4) Freight. When the material to be repaired is located overseas and no local capability to repair exists, the cost of freight to the U.S. will be included as an element of cost. In all other cases, cost of freight will be excluded.

g. Exclusions. The following costs will not be included in the estimate.

(1) Other Operating Expense Items. Such items as tires, tracks, batteries, tire chains, and antifreeze are not to be included as a cost in the repair estimate except where replacement is the result of accident damage.

(2) Modification Work Orders. The cost of applying modification work orders is not to be included in a cost to repair estimate.

(3) Accessories. The cost to overhaul or replace accessory items used to adapt the equipment for special uses, such as sirens, flashing lights, rank insignia, two-way radios, fire extinguishers, tool kits, or similar items, is not to be included in the cost of repairs estimate. This will eliminate from such cost estimates the cost to repair for items the replacement or acquisition cost of which is not included in the standard inventory price of the item. Individual estimates of cost to overhaul such items will be made as appropriate and required.

10-4. Replacement Planning and Programming--Construction, Railway, and Weight Handling Equipment. Replacement of construction, railway, and weight handling equipment must be planned and programmed in the budget year requirement program as described in NAVFACINST 11200.19 (current edition).

10-5. Repair and Replacement Determinations--Construction, Railway, and Weight Handling Equipment.

a. **Equipment With Replacement Cost Under \$60,000.** The determination of whether to replace or repair a unit of equipment with a replacement cost of \$60,000 or less may be guided in part by the one-time extensive repair limits shown in Appendix C. Determination procedures are similar to those for automotive vehicles (paragraph 10-2). If the age of the item under consideration exceeds the life expectancy, the repair percentage shown in the last applicable year (Appendix C) should be used.

b. **Equipment With Replacement Cost Over \$60,000.** The determination of whether to replace or repair a unit of equipment with a replacement cost in excess of \$60,000 shall be based on the computations derived from completing the Requirements Cost Evaluation--Transportation Equipment Form (NAVFAC 11200/30), in accordance with the procedures described in NAVFACINST 11200.19 (current edition). Whenever it is determined that an item of construction, railway, or weight handling equipment should be replaced in accordance with the criteria established herein, and a replacement unit is not currently available (as determined by the cognizant EFD (TEMC)), the equipment may be provided with minimum repairs sufficient to ensure safe operation and continued use on a temporary basis pending its scheduled replacement.

CHAPTER 11. DISPOSAL/REDISTRIBUTION OF EXCESS TRANSPORTATION EQUIPMENT

11-1. Disposition Processes. Transportation equipment (listed in Appendix G) excess to activity allowances or current requirements will be processed via the cognizant NAVFACENGCOM TEMC (Transportation Equipment Management Center) in all instances. If excess equipment is usable, the TEMC will ascertain if there are other Navy requirements for the equipment and provide direction for its transfer. If there are no other Navy requirements for usable equipment, the TEMC or CBC PORHUE will instruct the activity to effect a disposal proceeding with the appropriate DPDO (Defense Property Disposal Office). When equipment is not usable, the activity will initiate the disposal proceeding with the appropriate DPDO (with copies of all disposal documentation provided to the TEMC) in accordance with the Defense Disposal Manual (DOD 4160.21M), NAVSUP Manual Vol II, and NAVCOMPT Manual (Par. 036303-036305).

11-2. Reporting of Excess Transportation Equipment. Documentation by the holding activity for excess equipment removed from service varies according to condition of equipment:

a. If in usable condition, forward a SF 120 (Report of Excess Personal Property) to TEMC;

b. If not in usable condition, equipment is to be turned in to the appropriate DPDO on DD Form 1348-1 (DoD Single Line Item Release/Receipt Document). The DPDO also requires the equipment maintenance record and the information listed on the SF 120 as outlined below. Once equipment is turned in to the DPDO, forward one DPDO-receipted copy of the DD Form 1348-1, a copy of the SF 120, and a copy of the DD 1342, Property Record, to the TEMC. Information on the SF 120 shall include the USN registration number, NAVFAC Equipment Code, description (Appendix G), make, model, year of manufacture, serial number of chassis and engine, accumulated miles or operating hours, condition code (Appendix N), identity and value of parts missing, and cost of rehabilitation sufficient for further use. Ambulances and other special medical and dental vehicles will be listed on SF 120, separate from other equipment, which will be forwarded by the TEMC to CBC Port Hueneme via the Naval Medical Support Command.

11-3. Disposition of Usable Excess Transportation Equipment (Shore Activities). Excess equipment determined by the holding activity to be in Federal Condition Codes (see Appendix N) other than H or S (Supply Condition Code) and/or 3, 6, 9, X or S (Disposal Condition Code) is considered to have potential for further use and redistribution within the Navy. Such equipment will be screened by the TEMC, upon receipt of the SF 120 (original and six copies). If transfer to another activity already supported by the TEMC is warranted, instructions will be issued within 15 days from receipt of the SF 120. These transferred items will be lined out on the SF 120 then the TEMC, at its option, will forward the SF 120 (original and five copies) to CBC Port Hueneme CA (Code 15, CESO) for further screening for possible transfer to fill other Navy requirements. CESO will screen and refer any usable excesses to any TEMC having unfilled requirements. Upon acceptance of the excess by the TEMC, CESO will issue shipping instructions to the holding activity with a copy to the receiving activity and to the TEMC approving the transfer action. Prior to shipment, a physical condition check should be made by the receiving activity.

to avoid the waste of shipping costs for equipment that is in unsatisfactory condition. The SF 120 containing undistributed excess items will be returned to the original holding activity with instructions to transfer excess items to the appropriate DPDO. The holding activity shall process property record disposition actions in accordance with paragraph 11-6.

11-4. Disposition of Unserviceable Excess Transportation Equipment (Shore Activities). Excess equipment determined by the holding activity to be in Supply Condition Codes H or S is considered to be unsatisfactory for further Navy use; that is, equipment not meeting Navy's repair criteria (Appendix C) and equipment good for scrap only. These instances will be processed through DPDO for disposal with a DD 1348-1, maintenance record, and SF 120 (such as usable equipment excess to the Navy as described above).

11-5. Disposition of Excess Transportation Equipment From Ships and Afloat Commands. Ships and afloat commands holding transportation equipment which is excess to allowance will transfer both custody and accountability for excess vehicles to the Atlantic Division (LANTDIV), NAVFACENGCOM, Norfolk, VA, if in the Atlantic area, or to the Pacific Division (PACDIV), NAVFACENGCOM, Pearl Harbor, HI, if in the Pacific area.

11-6. Disposition by Survey. A survey is the procedure required when Navy property or Defense Logistics Agency material in Navy custy is lost, damaged or destroyed (except in incoming shipments). (Survey action is not required for class 3 plant account property that has become obsolete or expended from normal usage, but is disposed as described above). The first step in processing lost, damaged or destroyed property is to determine responsibility and to fix actual loss to the government. If no personal responsibility is evident, DD Form 2090, GPLD(Government Property Lost or Damaged) Survey Certificate, will be used. When personal responsibility is established, DD Form 200, Report of Survey, is used. These forms replace the NAVSUP Form 154. Processing disposals by survey, a complex and costly procedure, requires reference to NAVSUP Manual Vol. II, Section VI as amended by NAVSUPNOTE 7200, subj: Accounting and Reporting of Goverment Property Lost, Damaged or Destroyed, of 29 Aug 1980. Inform the cognizant TEMC in writing of action taken, including copies of DD 1342, Property Record, and the applicable survey form.

11-7. Inventory Record Adjustment. It is essential that the holding activity complete the property reporting action described herein to ensure that NAVFAC-ENGCOM inventory records properly reflect all disposal actions. In such actions, the holding activity shall annotate the DOD Property Record (DD Form 1342) in Block 54 with the appropriate transaction code and replacement standard description code in accordance with the NAVCOMPT Manual, Volume 3, Chapter 6, paragraph 036206. The holding activity disposing of vehicles and equipment by transfer to the property disposal officer or transfer to another activity will forward a copy of the DD 1342 covering the equipment transferred to the fiscal officer of the accountable activity, who will annotate the disposal information and forward a copy of the DD 1342 to CBC Port Hueneme (Code 15) and to the appropriate TEMC.

11-8. NAVFACENGCOM EFD's Designated to Process Disposal Actions. The NAVFAC-
ENGCOM EFD's (TEMC's) shown in the following list are designated to receive
and process the Reports of Excess Personal Property (SF 120's) for transporta-
tion equipment.

<u>Activity Location or Claimant Chain</u>	<u>NAVFACENGCOM Field Divisions</u>
All activities in Pacific area and Fourteenth Naval District	Pacific Division TEMC, Pearl Harbor, HI
All activities in claimant chain CNET, CHNAVRES, AND OCEANAV	Naval Training Branch SOUTHEANAVFACENGCOM TEMC Pensacola, FL
All activities in Atlantic, Mediterranean, and Caribbean areas, and Fifth Naval District	Atlantic Division TEMC Norfolk, VA
All activities in Washington (DC) based claimant chain except as otherwise geographically assigned herein	Chesapeake Division TEMC Washington, DC

CHAPTER 12. GENERAL TRANSPORTATION OPERATION

12-1. Activity Transportation Organization. The administration of transportation equipment matters at an activity should be the responsibility of a specifically designated component of the activity. This component is usually described as the "Transportation Division" and, in large activities, is a part of the Public Works Department (PWD). Transportation functions in smaller activities are often administered by a transportation branch or transportation section.

a. Responsibilities. The Transportation Division (or branch/section) is responsible for providing transportation and equipment services to all components of the activity. These services include, where applicable:

- (1) Operating vehicle and equipment pools.
- (2) Operating scheduled and unscheduled passenger and freight transport systems.
- (3) Maintaining automotive, construction, railroad, mobile fire-fighting, and weight handling or materials handling equipment.

b. Organizational components. Depending on the size of the activity, the Transportation Division normally will consist of three branches: an Operations Branch, Equipment Maintenance Branch and Production Control Branch, all under a Transportation Division Director or Transportation Superintendent. Some smaller Transportation Divisions may only consist of two branches: an Operations Branch and an Equipment Maintenance Branch, both under a Transportation Division Director or Transportation Superintendent. In both cases the Transportation Director (or Superintendent) is responsible for planning, organizing, and developing equipment, manpower, and funding requirements; and directs, supervises, controls, and coordinates the activities of the branches. The Director (or Superintendent) is responsible for achieving the objectives of the Division by providing responsive transportation services to the activity with safe and reliable vehicles and equipment in a cost effective manner. The major functions of the branches are as following.

(1) Operations Branch.

- (a) Operates activity bus and taxi system for movement of personnel.
- (b) Operates trucking system for intrastation movement of material and equipment.
- (c) Operates solid waste collection system.
- (d) Provides equipment with operators for facilities maintenance functions, including special rigger and equipment for heavy lifts and movements.
- (e) Assigns vehicles on long term to using departments (Class B assignments, as described in Chapter 5, paragraph 5-2).

(f) Operates station motor pool and assigns vehicles on daily or trip basis (Class C assignments), and responds to all intermittent random requests.

(2) Production Control Branch.

(a) Plans and schedules all maintenance actions and insures efficient shop loading and minimum vehicle downtime.

(b) Inspects vehicles and equipment, diagnoses maintenance needs, directs maintenance actions to be performed insuring safety, reliability and cost effectiveness of actions directed.

(3) Equipment Maintenance Branch.

(a) Accomplishes maintenance actions with maximum productivity and quality of work with minum use of parts and material (See Chapter 16, paragraph 16-7.b. for further information on the Equipment Maintenance Branch)

(4) Equipment Maintenance Branch, without a Production Control Branch.

(a) Plans and schedules all maintenance actions and ensures efficient shop loading and minimum vehicle downtime.

(b) Inspects vehicles and equipment, diagnoses maintenance needs, directs maintenance actions, and ensures that those actions are taken in a safe, reliable, and cost effective manner.

(c) Accomplishes maintenance actions with maximum productivity and quality of work with minimum use of parts and materials. (See Chapter 16, paragraph 16-7.b. for further information on the Equipment Maintenance Branch.)

(4) Subordinate Components. Depending on the size of the activity, subordinate organizations designated as functional sections may be established to carry out the functions within the two main branches of a Transportation Division. Such sections normally are headed by a foreman or general foreman. Possible sections are as follows.

(a) Under the Operation Branch: Station Bus Section, Taxi Section, Heavy Equipment Section, Crane and Rigger Section, and Operator Licensing and Examining Section.

(b) Under the Maintenance Branch: Shop or Production Control Section, Inspection and Estimating Section, Automotive Repair Section, Heavy Equipment Repair Section, and Materials Handling Equipment Repair Section.

12-2. Transportation Equipment Transshipment Yard.

a. Functions of the Transportation Equipment Transshipment Yard. The Transportation Equipment Transshipment Yard is used to accomplish the following functions.

(1) Provide a means of receiving and processing newly procured vehicles for issue to activities within the office, bureau, or command (claimant) areas. Generally, vehicles and equipment will be shipped to the activity direct from the manufacturer in order to reduce shipping and handling expenses.

(2) Receive and process usable vehicles and equipment for reassignment that may become available within the claimant areas.

(3) Receive and process unserviceable vehicles and equipment for disposal when they are not assigned to a using activity.

b. Administration. The EFD (TEMC) is to administer the Transportation and Equipment Transshipment Yard. A minimum quantity of vehicles and equipment may be held temporarily in the yard, consistent with good management practices. Only that equipment which, due to its condition, is to be retained for further assignment and use will be retained in the yard. This equipment is to be reported in an "H" status for inventory purposes. If there is no known requirement in the claimant area for the equipment, it is to be immediately reported to CBC Port Hueneme (Code 15) on Standard Form 120. It is expected that the EFD (TEMC) will use all available good equipment to upgrade poorer equipment at adjacent activities. Requests are not to be made to CBC Port Hueneme (Code 15) to supply new equipment when similar equipment is being retained in the yard. Further, it is emphasized that the yard is not an operating pool, and that the equipment retained in the yard will not be dispatched or used to satisfy operational requirements except under emergency conditions.

12-3. General Services Administration Interagency Motor Pools and Systems.

Under the provisions of Title 10, U.S. Code, 133, authority has been delegated to the Secretaries of the Army, Navy, and Air Force to exercise powers, functions, and duties conferred upon the Secretary of Defense by Section 491 of Title 40, U.S. Code, and as implemented by Executive Order 10579, providing for the establishment and operation of interagency motor vehicle pools and systems. Under the Executive Order, the Administrator of General Services is responsible for establishing and operating interagency pools and systems, and for developing necessary data and cost statistics for use in determining the economic feasibility of establishing an interagency motor pool system in a particular area. When such consolidation appears to be feasible, the DOD components will be notified that a study is to be made. NAVFACENGCOM EFD's (TEMC's) have been assigned Navy coordinating responsibility within their respective support areas for all matters connected with General Services Administration (GSA) interagency motor pools and system participation. Each component receiving notice that a GSA study is to be made shall make pertinent information available and designate officials with whom GSA may consult. Costs and other records shall be provided, to include inventory, operations, facilities, maintenance, and personnel and utilization data in the area being studied. When GSA considers that it is appropriate to establish an interagency motor pool system, a formal determination to that effect will be made.

12-4. Policy and Procedures for Testing and Licensing Vehicle and Equipment Operators.

a. Policy. It is the policy of the Navy to ensure that all military personnel, civilian employees, and contractor personnel operating vehicles and equipment on a naval installation are qualified and properly licensed. Contractor personnel operating Government-owned vehicles/equipment shall meet the requirements of this paragraph. Where contractors provide contractor-owned or leased vehicles/equipment and operators on a Navy installation, contracts and agreements shall require that equipment and operators meet all of the requirements of the Code of Federal Regulations, Department of Transportation Federal Motor Carrier Safety regulations, and comply with the licensing requirements of state and local motor vehicle laws. Most States now have a classified motor vehicle operator's licensing program that includes appropriate examination to ensure knowledge of traffic laws, ability to read road signs, vision, and color recognition; and to ensure by road test a competency to operate a specific class of vehicle. It is Navy policy to accept, without further testing and examination, a valid operator's license issued by a State or jurisdiction as proof that the applicant has achieved the proficiency level to safely operate Government vehicles up to 10,000 pounds gross vehicle weight (GVW). Examination and testing of motor vehicle operators by Navy activities will be limited to personnel required to be licensed to operate vehicles over 10,000 pounds GVW and special purpose vehicles, and to military personnel not possessing a valid State license. Further, it is Navy policy to ensure that military and civilian personnel receive continuing vehicle and equipment safety training designed to reduce accidents.

b. Applicability. The policy and procedures set forth herein are applicable to all naval activities, afloat and ashore, including ships, and will include military and civilian operators of all motor vehicles and construction/weight handling equipment. These policies and procedures are not applicable to operators of aircraft ground handling and servicing equipment under the cognizance of the Naval Air Systems Command, or to operators of materials handling equipment under the cognizance of the Naval Supply Systems Command. Commanding Officers of shore activities and ships have authority to issue the U.S. Government Motor Vehicle Operator's Identification Card (Standard Form 46) under the procedures prescribed herein, and the Construction and Weight Handling Equipment Operator's License (NAVFAC Form 11260/2) in accordance with the procedure set forth in NAVFAC P-306.

c. DoD Contract Personnel DoD contract personnel will not be issued a SF-46 (U.S. Government Motor Vehicle Operator's Identification Card)

d. Motor Vehicle Operator's Testing and Licensing Procedures. The minimum regulations issued by the Office of Civilian Manpower Management govern all agencies in authorizing their civilian employees to operate Government-owned vehicles for official purposes and are set forth in Chapter 930 of the Federal Personnel Manual. In addition, activities shall comply with the procedures prescribed herein for military and civilian operators, and with current regulations prescribed in the following publications as applicable to all affected vehicle operators.

- (1) Driver's Handbook, Ammunition, Explosives, and Dangerous Articles (NAVSEA OP-2239).
- (2) Navy Transportation Safety Handbook (NAVSEA OP-2165, Vol. I.)

- (3) U.S. Department of Transportation, Federal Highway Administration, Motor Carrier Safety Regulation, 59 Code of Federal Regulations, Parts 200-999.
- (4) State and local laws and regulations.
- (5) Navy Drivers Handbook (NAVFAC MO-403).

In addition to the foregoing publications and the regulations prescribed herein, Commanding Officers of activities or installations may prescribe more stringent or additional qualifications, requirements, examinations, or certifications as may be required in testing personnel for issuing the SF 46, or for suspending or revoking the SF 46. Suspension or revocation of the SF 46 for civilian operators, however, shall be consistent with the Federal Personnel Manual.

e. License Applications. Prospective operators of Government motor vehicles shall be selected and recommended by their military or civilian supervisors, based on a prior interview. To obtain an SF 46, Parts I and II of NAVFAC Form 11240/10, Application/Record for U.S. Government Motor Vehicle Operator's Identification Card, shall be completed and signed by the supervisor. Both the NAVFAC 11240/10 and a filled-in Standard Form 47, Physical Fitness Inquiry for Civilian Motor Vehicle Operators, shall be forwarded to the office responsible for issuing the SF 46.

f. Issue of SF 46 for Operators of General Purpose Vehicles up to 10,000 Pounds GVW. Military personnel are exempt from possession of an SF 46 for operation of Government-owned or leased general purpose vehicles under 10,000 pounds GVW provided they have in their possession a valid State operators license for the type and class of Government vehicle to be operated. Civilian personnel may be issued an SF 46 to operate Government vehicles up to 10,000 pounds GVW provided the following requirements are met.

(1) Possession of a valid State operator's permit for the type and class of vehicle to be operated. For military personnel not possessing a valid State operator's permit, see paragraph h. following.

(2) Capable of making motor vehicle accident reports.

(3) If a civilian meets the physical fitness requirements of the Federal Personnel Manual, Chapter 930.

(4) Capable of operating a manual shift transmission. NOTE: If the applicant is capable of operating only an automatic transmission vehicle, the SF 46 may be issued but restricted by a statement thereon "RESTRICTED AUTOMATIC TRANSMISSION VEHICLE ONLY."

g. Issue of SF 46 for Operators of Trucks Over 10,000 Pounds GVW, Buses (Over 10-Passenger), Emergency, and Special Purpose Vehicles.

(1) Civilian applicants must possess a valid State operator's permit for the type and GVW class for which the SF 46 will be issued for operating the vehicle on and off base.

(2) Military applicants must possess a valid State operator's permit for the vehicle type and class if operation is off base in those States requiring a valid State operator's permit (see paragraph h. following).

(3) A civilian applicant shall meet the physical fitness requirements of the Federal Personnel Manual, Chapter 930.

(4) All applicants shall be given a written test, devised by the activity, that will ensure the applicant's knowledge of all applicable Federal, State, and local laws and safety regulations governing the operation of the specific type vehicle for which the SF 46 is to be issued.

(5) All applicants shall be given a written and operation test, devised by the activity, to evaluate and demonstrate the applicant's knowledge and operational ability with respect to each type of vehicle or special purpose equipment for which the applicant is to be issued a SF 46. The operational performance test will require the applicant to perform various tasks that reflect typical operations. See paragraph i. following for additional requirements for operators transporting explosives and hazardous materials.

h. Testing Military Personnel Not Possessing a Valid State Driver's License for Operating General Purpose Vehicles up to 10,000 Pounds GVW. Members of the Armed Forces are exempt from the requirement to possess a State driver's license when operating a Government-owned or leased vehicle on official business in all States except Alaska, Massachusetts, Nebraska, Missouri, New Hampshire, New Jersey, New York, Connecticut, Vermont, and the District of Columbia. Military personnel not possessing a valid State operator's permit where required for off-base driving in these areas may operate on base. However, all military personnel operating a Government-owned vehicle on and off base must have a valid SF 46 in their possession. Issuance of a SF 46 to military personnel without a valid State operator's permit will be as follows.

(1) Personnel will be given a written test, devised by the activity, to evaluate the applicant's ability to read and understand official traffic control devices, safe driving practices, and State and local traffic laws.

(2) Applicants will be provided instruction on the operator's responsibility for vehicle inspection, accident reporting procedures, safety inspection, and preventive maintenance.

(3) A practical road test will be given the applicant on the largest type vehicle (up to 10,000 pounds GVW) for which the SF 46 is to be issued.

(4) A SF 46 shall not be issued if the applicant's current State driver's permit is revoked or suspended.

(5) Applicants requiring a SF 46 to operate trucks over 10,000 pounds GVW, buses over 10-passenger capacity, and emergency and special purpose vehicles will be qualified as specified in paragraph g. preceding.

(6) Applicants must meet the minimum age requirement of the State for the class of vehicle for which the SF 46 will be issued.

i. Testing Operators for Transportation of Explosives and Hazardous Material. Regulations established by NAVSEA OP-2239, Driver's Handbook, Ammunition, Explosives, and Dangerous Articles, are to be applied to all applicants applying for a SF 46 where operators will be engaged in transporting ammunition, explosives, or other dangerous articles. Such operators shall be familiar with NAVSEA OP-2165, Navy Transportation Safety Handbook, Volume I, and the U.S. Department of Transportation, Federal Highway Administration Motor Carrier Regulations, as well as with all State and local laws and regulations regarding the transportation of ammunition, explosives, and other hazardous or dangerous articles.

j. Physical Fitness Review. Every 3 years, or less if deemed necessary, activities must provide for the review of physical fitness of all civilian employees operating Government-owned or leased motor vehicles, in accordance with the standards and procedures established by the Office of Civilian Manpower Management. The Physical Fitness Inquiry (SF 47) for civilian motor vehicle operators is to be completed in accordance with Appendix A, Chapter 930, Federal Personnel Manual.

k. Standard Form 46, U.S. Government Motor Vehicle Operator's Identification Card. Each motor vehicle operator shall be issued a SF 46 in accordance with the following procedures.

(1) The SF 46 must show:

(a) Each type of motor vehicle the cardholder is authorized to operate.

(b) Restrictions imposed, such as geographical area. These restrictions shall reflect those imposed by the State driver's license held by the operator.

(2) The SF 46 must be signed by the operator.

(3) Each SF 46 is to be numbered and a chronological record of issuance maintained.

(4) The number of the SF 46, with the completed application record, shall be forwarded to the personnel office for entries to be made in the operator's personnel record.

(5) Pursuant to the Federal Personnel Manual, Chapter 930, each civilian motor vehicle operator shall be instructed that the SF 46 is void unless accompanied with a valid State operator's license for the type and size of vehicle to be operated. In addition, the following notation shall appear on each SF 46 issued to a civilian driver: "VOID UNLESS ACCOMPANIED WITH A VALID STATE OPERATOR'S LICENSE FOR CLASS OF VEHICLE BEING OPERATED." For military operator requirements, see paragraphs f. and g. preceding.

1. Expiration, Renewal, Revocation, and Cancellation of SF 46.

(1) Expiration and Renewal. The SF 46 is valid for 3 years and may be renewed for additional periods of 3 years each. The renewal is dependent

upon a determination by the issuing authority that the operator continues to meet the prescribed physical standards and continues to demonstrate competence in driving the motor vehicles the individual is authorized to operate.

(2) Revocation. The SF 46 may be revoked or suspended for cause by the operator's Commanding Officer or his designated representative. Suspension and revocation of the SF 46 for civilian operators shall be in accordance with procedures prescribed in the Federal Personnel Manual. A revoked SF 46 will not be restored until it is determined that the operator is fully qualified through reevaluation and reexamination. Suspended operators are usually suspended for a designated time period with no further testing required for reinstatement.

m. Operation of Motor Vehicles by Personnel in Travel Status. Military and civilian personnel who must occasionally drive a vehicle while temporarily away from their official duty stations may operate Government-owned or leased vehicles without a SF 46, provided that:

- (1) They possess a valid State driver's license for the type of vehicle they are to operate;
- (2) Their activity has authorized the use of a vehicle in official travel orders;
- (3) The driving of vehicles without a SF 46 does not extend to those personnel who may occasionally require the use of a vehicle at their duty stations.

n. National Driver Register (NDR)

(1) The Department of Transportation provides a central US driver records identification facility which contains identification information on drivers whose licenses have been denied, suspended, or revoked. The states provide DoD with data for the register and utilize the register (via computer inquiry) for evaluating initial and renewal applicants for licensing.

(2) DoD Components may make use of data in the NDR in evaluating applicants for an SF 46. As a minimum, DoD Components shall utilize the NDR to verify driving records on initial applicants for an SF 46 when the applicant does not possess a valid state driver's license, or when the issuing activity has reason to suspect a poor driving record of an applicant with a valid state license. DoD Components shall not provide the Department of Transportation with data on SF 46 suspensions or revocation action. DoD Components may also utilize the NDR when issuing a new or renewal SF 46. Data received from the NDR shall be utilized by the issuing agency to deny or approve SF 46 issue/renewal actions.

(3) DoD Components may obtain instructions and material for participation in the NDR by contacting; The National Drivers Register, National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington, D.C. 20590

o. Testing and Licensing of Construction, Weight Handling, and Railroad Equipment Operators. Construction, weight handling, and railroad equipment

operators shall be tested and licensed in accordance with procedures in NAVFAC P-306. The prescribed tests cover the most commonly used equipment. Tests for equipment not covered by NAVFAC P-306 will be developed locally, using the prescribed tests in NAVFAC P-306 as a guide. Copies of all tests developed locally should be forwarded to NAVFACENGCOM, Code 120.

(1) In the case of self-propelled railroad equipment, tests should be based on the "Standard Code of Operating Rules" published by the Association of American Railroads.

(2) All civilian and military personnel (excluding contract personnel) who operate either full time or part time the Navy-owned equipment listed in Table 12-1 shall have in their possession a valid Construction and Weight Handling Equipment Operator's License, U.S. Navy (NAVFAC Form 11260/2).

12-5. Use of Navy-Owned Transportation Equipment by Commercial Contractors.

a. General Policy.

(1) Service Contracts. Where an activity transportation function or subfunction is to be contracted as a single action or as part of a contract package (multiple commercial industrial functions), necessary motor vehicles, construction, and mobile weight handling equipment (transportation equipment) may be provided as Government-furnished equipment (GFE) to the contractor for operation in performance of the functions specified in the contract. All transportation equipment provided under such contracts will be subject to the procedures of NAVFACINST 11200.12 (latest edition), included within CNO approved allowances and identified in the Technical Record Control System by the symbol "O".

(2) Government Owned, Contractor Operated (GOCO) Facilities. As a general policy, Navy GOCO contractors are required to provide all necessary transportation equipment needed for contract performance. Where Navy-owned equipment is available and it is determined to be in the best interest of the Government for the contractor to use the equipment, it will be turned over to the contractor in an "as is" condition for operation in the performance of the contract. Equipment in this category will be identified in the Technical Record Control System by the symbol "C" and will not be controlled by allowances. All maintenance, repair, and operation of such equipment will be the responsibility of the contractor until the equipment is returned to the Government.

b. Vehicle Identification in Contract Use. Transportation equipment acquired for official purposes by a naval activity and operated by a contractor will be marked to indicate U.S. Government ownership. Markings will be in accordance with DOD Regulation 4500.36R and this publication. For "C" status equipment, special markings such as contract number, name of firm, etc., may be used when approved by NAVFACENGCOM. Contractor-operated vehicles may also be identified by use of official U.S. Government or other license plates as may be required.

12-6. Commercial or Industrial (C/I) Activities Program. In recent years, a variety of factors have served to decrease the availability and use of Govern-

Table 12-1

NAVFAC Equip Code	Equipment Description
2520 thru 2521	Distributor, Asphalt Water
3111 thru 3165	Compressors
4210 thru 4270	Crane, Crawler
4310	Excavator, Multipurpose
4410 thru 4450	Graders
4510 thru 4540	Loaders
4605 thru 4660	Rollers
4710 thru 4750	Scrapers
4760 thru 4806	Off-highway Trucks, Trailers, & Tractors
4809 thru 4851	Tractor, Crawler
4865 thru 4894	Tractor, Wheel
5630	Self-propelled Lawnmowers over 30 hp
5720	Sweeper, Street
5745	Sweeper, Airfield
5750 thru 5757	Snowplow, Single Purpose
6210, 6220, 6222, 6230, 6240 & 6250	Car Railroad, Inspection/Maintenance
6520 thru 6580	Locomotives Railway
8200 thru 8240	Cranes, Truck Mounted
8240 thru 8245	Cranes, Crash
8245 thru 8254	Cranes, Hydraulic
8405 thru 8430	Cranes, Railway
Equipment listed in Appendix I	Overhead Traveling Crane Portal Crane Floating Crane Hammerhead Crane Gantry Crane Stiff Leg Derrick

ment forces in the performance of maintenance, operating, and other base support services at Navy activities. The policy and procedure for the operation of the Navy commercial or industrial (C/I) activities are contained in NAVMAT-INST 4860.12 (current edition) and are implemented by related NAVSUPSYSCOM and NAVFACENGCOM letters. The revised Office of Management and Budget (OMB) Circular A-76 of March 29, 1979, on the subject of policies for acquiring commercial or industrial products and services needed by the Government provides increased emphasis on the relative economy of Government as compared with contract performance. It also provides a comprehensive Cost Comparison Handbook as a supplement to Circular A-76. Program inquiries connected with transportation equipment support shall be directed to the appropriate NAVFACENGCOM EFD.

12-7. Motor Fuel Security Measures. The increasing cost and scarcity of motor fuel may require special security measures in certain areas to prevent theft. A list of suggested fuel security measures for various areas is available from the several EFD's (TEMC's).

12-8. Recording Fuel Issues by Service Stations and Fuel Trucks.

a. General. Procedures shall be established at each activity to ensure adequate fuel accountability. Methods existing for dispensing and accounting for fuel issues vary among activities from totally manually operated to fully automated systems. Activities interested in updating their dispensing and control of fuel may request assistance from their cognizant EFD, TEMC.

b. Records. Each activity shall maintain accurate records of fuel issues by equipment registration/identifications number. Dispensing pump meters shall be checked daily and reconciled with issue records to ensure fuel dispensed is accounted for. Records of fuel issue by equipment registration/identification number will be maintained by the Transportation Department Division for management evaluation. Records of bulk issues to fuel servicing tank trucks and the subsequent issues to equipment shall similarly be recorded and reconciled.

12-9. Fire Extinguishers on Transportation Equipment.

a. Policy. Except for the items listed in the following paragraph, it is the policy of the Navy to eliminate the installation of fire extinguishers on automotive vehicles operated on Government property or within the confines of municipal or metropolitan areas contiguous thereto, where fire protection is normally provided.

b. Exceptions. Fire extinguishers shall be installed on the following types of vehicles.

(1) Buses.

(2) Ambulances.

(3) Vehicles regularly used to carry explosives, acids, compressed gases, fuel, or other dangerous articles.

(4) Police and patrol vehicles.

(5) All emergency vehicles of structural and crash fire departments.

(6) Vehicles dispatched on trips where fire protection is not readily available; vehicles occasionally used to carry explosives and other dangerous articles; and vehicles hauling equipment covered with tarpaulin in the body of the truck are to be provided with fire extinguishers on an incident basis.

c. Special Authorization. In an emergency, where it is considered essential that a fire extinguisher be temporarily installed in an automotive vehicle other than those listed in the preceding paragraph, the Commanding Officer of an activity may grant such permission. The extinguisher is to be removed when the emergency has expired.

12-10. U.S. Government National Credit Cards.

a. General. U.S. Government National Credit Card (Standard Form 149) and commercial credit cards have been authorized for use by U.S. Government agencies in obtaining service station motor vehicle fuel and services. SF 149 is the only credit card authorized for use within DOD for obtaining commercial service station fuel and services at facilities listed in the current issue of the Defense Fuel Supply Center Contract Bulletin. These facilities may provide the following.

(1) Fuels: regular unleaded, premium unleaded, special unleaded, regular leaded, premium leaded, aviation grade, unleaded for boats; diesel and diesel marine fuel, fuel oil, gasohol, and aviation turbine fuel.

(2) Lubricating services and lubricants (including differential and transmission lubricants).

(3) Ethylene glycol antifreeze.

(4) Oil filter elements and servicing.

(5) Air filter service.

(6) Battery Charging.

(7) Tire and tube repairs.

(8) Washing and cleaning.

(9) Mounting and dismounting snow tires and chains.

(10) Emergency replacement of spark plugs, fan and generator belts, windshield wiper arms and blades, lamps, etc.

b. Application. The U.S. Government National Credit Card must only be used when motor pool or similar type facilities are not readily available. Detailed information on the acquisition, accounting, and control of U.S. Government National Credit Cards is contained in the NAVSUP Manual, paragraph 23087.

c. Use of Self-Service Gasoline Stations. Operators of Navy motor vehicles who purchase gasoline with SF 149 are required to use service stations under contract to the Government where available. Listings of these service stations are available from activity Supply Officers. When SF 149 is used for the purchase of gasoline, operators shall be instructed to use self-service gasoline pumps in order to reduce costs by avoiding the fuel dispensing labor cost resulting from full fuel service. The increase in the availability of self-service gasoline pumps at commercial service stations presents a potential of considerable reduction in motor vehicle operating costs.

12-11. Analysis and Evaluation of Transportation Equipment Operations.

a. Purpose. The purpose of utilization analysis is to obtain essential information by which management evaluations can be made of the efficiency of automotive and construction equipment operations.

b. Automotive and Construction Equipment Utilization Program. One of the principal purposes of the utilization program is to provide a basis for determining, justifying, obtaining, and adjusting equipment allowances and inventories. Related operations and maintenance cost data are available from the Transportation Cost Report (TCR) as a byproduct of the Operating Budget/Expense Report (NAVCOMPT Form 2168). A careful analysis of utilization data reveals whether or not acceptable equipment usage is being achieved, based on comparisons with preestablished targets generated from historical usage data and the activity mission. Further, review of NAVCOMPT Form 2169, Performance Statement, will indicate if operations costs are on target. Variances from the uniform rates established in the NAVCOMPT Form 2168 budget plan shall be analyzed.

c. Utilization Analysis. Activities experiencing a 10 percent utilization decrease under the targets established for any one vehicle Alpha Group shall conduct an analysis to determine if existing assignments are needed, or to establish the cause of the decrease. Timely action to remove equipment excess to the needs of the activity may avoid their being reported excess on the Annual Allowance and Requirements Review (NAVFAC Form 11200/28).

d. Information Source. Information required to complete a study when circumstances indicate can be obtained by requiring all users of station equipment to complete the Motor Vehicle Utilization Record (Form DD 1970) daily for a given period of time (usually 3 months). Review of these forms and of the Dispatcher's Log (NAVFAC Form 9-11240/2) will allow a determination to be made.

e. Review of Class B Assignments. Periodic reviews will be made of all Class B vehicle/equipment assignments to an activity, unit, or function to ascertain if the using organization requires such transportation for the conduct of its official business. This is best accomplished by establishing a Transportation Review Board at the activity level. Action shall be taken to maintain Class B assignments at a very minimum.

f. Control of Scrip (Toll Tickets and Tokens). Procedures shall be established at each activity for the requisitioning, control and issue of scrip. The Public Works Officer shall ensure that only the minimum amount of scrip is made available to the Transportation Department/Division for the effective conduct of business. The Transportation Director is responsible to establish an accounting procedure to account for scrip issued by the Transportation Department/Division showing as a minimum the number of the scrip certificate, the monetary value, the date of issue, purpose, and signature of person to whom issued. The procedure used must be sufficient to provide an audit trail for monitoring receipts, issue and usage.

CHAPTER 13. OPERATION OF AUTOMOTIVE VEHICLES

13-1. Automotive Vehicle Operating Policy. It is Navy policy to operate automotive vehicles in accordance with State and local traffic safety laws and emissions standards.

13-2. Shuttle Bus Service (Scheduled Activity Bus Service).

a. General. It is Navy policy to provide sufficient bus service to effectively support activity missions. The capability to transport groups of individuals on official business between offices on installations or between nearby installations is a recognized requirement and is essential to activity mission support. The effective use of buses reduces the requirement for smaller types of passenger-carrying equipment (sedans, station wagons and carryalls) to be authorized and assigned at installation motor pools.

b. Shuttle Bus Service. When required to support the station mission, shuttle bus services may be provided within or between installations for the transportation of:

(1) Enlisted personnel residing in the dormitory without dependents between troop billets and work areas.

(2) Military personnel and employees between offices and work areas of the installation or activity during normal duty hours. These routes will be designated to service offices and work areas only and will not include base housing areas, recreational or shopping areas unless these areas cannot reasonably be avoided in serving the authorized points.

The following instructions apply to establishing and maintaining shuttle bus routes:

(1) Established routes and schedules must be based on a validated need to transport passengers authorized above. Shuttle bus routes will not be used to provide domicile-to-duty travel except as authorized above.

(2) The conveyance used must be no larger than the most economical available to accommodate "duty" passengers.

(3) Frequent surveys (at least annually) must be conducted to ascertain that the conditions cited in (1) and (2) remain constant.

Space-available transportation on shuttle buses may be provided to the following categories of passengers:

- (1) Off-duty military personnel.
- (2) Reserve and National Guard members.
- (3) Dependents of active duty personnel.
- (4) Civilian employees.
- (5) Retirees.

(6) Visitors to the base (intra-installation only).

Shuttle bus service may be provided with Navy-owned or contract equipment. Expenses for the operation of such services will be paid from appropriated funds.

13-3. Group Transportation Services.

a. Authorization. The general authorization and criteria for group transportation services to and from places of employment (also referred to as home-to-work transportation) is contained in U.S. Code Title 10, Section 2632. Under this law, whenever the Secretary of a military department determines that the effective conduct of the affairs of the department requires assured and adequate transportation facilities, he may provide transportation service by motor vehicle, with a seating capacity of 12 or more passengers, to and from places of employment for individuals attached to, or employed in, that department. In each case where such services are provided, a reasonable fare shall be charged. In authorizing the establishment of such systems, the Secretary must determine that:

(1) Other facilities are inadequate and cannot be made adequate;

(2) A reasonable effort has been made to induce operators of private facilities to provide the necessary transportation, and such effort has been unsuccessful; and,

(3) The service to be furnished will make proper use of transportation facilities, and will supply the most efficient transportation to the persons concerned.

b. Vehicle Acquisition. When determinations have been made that such services are required, the Navy, subject to budget limitations and funding availability, may:

(1) Buy or hire motor vehicles having a seating capacity of 12 or more passengers;

(2) Maintain and operate the equipment by Government-owned or contractor facilities;

(3) Lease or charter the equipment to private or public carriers for operation under terms that are considered necessary by SECNAV, or by a designated officer of the Navy.

c. Requests for Group Transportation Service. Requests for authority to establish group transportation services shall be submitted through the command chain to OASD(MRA&L) for a determination. The following information shall be furnished.

(1) Name, mission, and location of the activity.

(2) Current military and civilian strength, and authorized changes that will affect transportation requirements. Show breakdown of work-shifts if applicable.

(3) A description of existing facilities, including the use of privately-owned vehicles, carpools, and group riding arrangements.

(4) Points to which service is required and the distance between the installation and each point.

(5) The number of people requiring recurring transportation between the installation and each point (indicate by shift if applicable).

(6) A statement describing the efforts which have been made to make existing facilities, public or private, adequate, or efforts to induce private operators to provide the necessary transportation.

(7) The type of service proposed, plus information concerning all necessary arrangements such as rentals, charters, rates, routes, and schedules; and type, source, number, and seating capacity of the equipment to be used. The amount of fare to be charged shall be stated and a map or sketch of the area enclosed. If the proposed service is to be operated with Government-owned vehicles, requests must indicate that the local commercial carriers have no desire or capacity to provide the service.

(8) A statement as to availability of appropriated funds to operate the service.

(9) The date on which the service is needed or can be started.

d. Transit Facility Control Number. After OASD(MRA&L) approval of the group transportation service request, a Transit Facility Control Number shall be assigned by NAVFACENGCOM for reference, control, and reporting purposes. The following procedures apply.

(1) In determining reasonable rates of fare, the rates charged by commercial carriers may be used as guidance.

(2) All fares and proceeds received from the operation of group transportation services must be accounted for and deposited in the U.S. Treasury as miscellaneous receipts.

(3) Transportation furnished under this provision shall be reviewed at least annually to determine its continuing validity.

e. Types of Fares for Group Transportation Services. Fares normally will be collected by the vehicle operator. Fares may be collected in any or all of the following forms.

(1) Cash

(2) Books of tickets

(3) Single-trip tickets

(4) Round-trip tickets

(5) Commutation tickets

(6) Identification as authorized to travel free of charge.

f. Selecting Types of Fares. In general, the use of cash fares should be discouraged. Serially-numbered tickets for payment of fares should be employed to the maximum extent. Tickets may be single-trip, round-trip, in books, or commutation tickets. In considering the type of tickets to be used, it should be noted that refunds may be paid only to the original purchasers. Ticket books and commutation tickets should provide space for the original purchaser's name, signature, and badge number if applicable, with the date of purchase shown.

g. Inventory Control of Tickets. An inventory control record of all types of tickets received from the printer (supported by a copy of the printer's invoice or delivery receipt) and of tickets issued to ticket agents for sale (supported by a signed custody receipt) shall be maintained by the office responsible for the control of tickets. At least once a month, a physical count of tickets on hand should be made and reconciled with the balance reflected by the inventory control record. Tickets returned to the custodian will be reported in his control record as a receipt and will be supported in the records of the ticket agent by a custody receipt. Ticket agents will maintain an inventory control record of tickets, recording the tickets received from the Transportation Officer (by denomination) and the tickets sold each day. At least once each month, the Transportation Officer will make a physical count of the tickets held by the agents, and the results of such counts will be reconciled with the agents' control records. The amount of sales recorded in the inventory control records will agree with the collections turned over for deposit with the Disbursing Officer. If the collections are given to a collection agent responsible for obtaining cash from all ticket agents for deposit with the tickets held by the agents, the results of such counts will be reconciled with agents' control records. The amount of sales recorded in the inventory control records will agree with the collections turned over for deposit with the Disbursing Officer. If the collections are given to a collection agent responsible for obtaining cash from all ticket agents for deposit with the Disbursing Officer, the ticket agent should obtain a custody receipt for the cash turned over. The custody receipt may be changed to indicate receipt for cash instead of tickets. The depositing collection agent will maintain a record of ticket sales, showing this data, to substantiate the Cash Collection Voucher (DD Form 1131), NAVCOMPT Manual, Volume 4, Chapter 3, paragraph 043004. Receipts will be deposited with the Disbursing Officer daily or at any other reasonable interval.

h. Use of Coin Boxes. Where coin boxes are used, the activity Disbursing Officer shall establish policy and procedures for accounting for cash deposits. Vehicles shall be equipped with tamper-proof coin boxes that permit visual inspection of coins inserted. If lock type boxes are used, the keys shall be kept by the Transportation Officer or an authorized representative other than the driver of the vehicle.

i. Annual Report. A report (NAVFAC Symbol 11240/16) indicating the actual expenditures chargeable to the home-to-work transportation facility operations shall be prepared as of the end of the fiscal year, using the format shown in Figure 13-1. This report shall be submitted by September 30 each year and forwarded to NAVFACENGCOM.

Date: 20 Oct 1979

FROM: Commanding Officer, Naval Facility Atlantic
TO: Commander, Naval Facilities Engineering Command
VIA: Commanding Officer, Atlantic Division, Naval Facilities Engineering Command

Subj: Report on Home-to-Work Transportation facility operating under Title 10, U.S. Code, Section 2632. Receipts credited to Symbol (Transportation Serv) and expenditures charged during fiscal year 1979 in connection with transportation of personnel to and from their place of employment by motor vehicle or water carrier.

1. The following report is submitted covering transportation provided under Title 10, U.S. Code, Section 2632.

(a) Transit Facility Number 80418 SECNAV Number (if any) _____

Location: Atlantic Island

Reporting Activity: NavyFac Atlantic

Activity Population: Military 340 Civilian 286

(b) U.S. Navy Number, type seating capacity and initial cost of each vehicle utilized:

USN Number	Vehicle Type	Seating Capacity	Initial Vehicle Cost
91-00000	Bus BOC	28	10,850
91-00000	Bus BOC	37	10,850

(c)

ITEM	VALUE
I. Receipts	\$ 1,038.40
II. Expenditures (Maintenance and Operation)	
(1) Labor (including operator's wages)	3,592.22
(2) Material	692.76
(3) Public Vouchers*	
(4) Total Expenditures	4,284.98
III. Excess of receipts over expenditures	

(d) Total miles operated by facility during fiscal year 11952

(e) Appropriation chargeable (Items I(1), (2), and (3)): 1791319.1958

(f) Disbursing Officer (Items I and II(3))

Name and Symbol Number: A. B. Cee LTJG SC USN P6900

(g) Accounting Station (Items II(1) and (2)) Name and Number:
Naval Facility N60000

(h) *List public voucher numbers: None

2. The receipts and expenditures shown above represent all operations of the transportation facility under Title 10, U.S. Code, Section 2632.

A statement indicating the continuing validity of this transportation is attached.

D. E. Free, Foreman Transportation

Signature and Title

Figure 13-1
Group Transportation Services Summary

13-4. Transportation for Activity-Approved Special Programs. Transportation provided for athletic teams, welfare, recreation, morale, and the Chaplain's program shall generally be organized on a group basis large enough to employ buses. The Commanding Officer of an activity may, however, authorize the use of vehicles with seating capacities less than buses where feasible and economically justified.

13-5. Liberty Bus Service. At naval activities where commercial transportation services are not available, or are inadequate for transporting liberty personnel, activity Commanding Officers may inaugurate liberty bus service. Liberty bus facilities that in any way parallel or compete with common carriers are not to be authorized unless the carriers provide the activity Commanding Officer with a letter indicating an unwillingness, disinterest, or inability to provide adequate service necessary to satisfy the requirements. Liberty bus service shall not be established in lieu of fare-charging group transportation services, nor used to transport civilians, military dependent personnel, or guests. Bus service furnished to military personnel on base is not considered liberty bus service.

13-6. Emergency Bus Service. In compliance with Title 10, Section 2632, U.S. Code, transportation between domicile and places of employment may be provided for military personnel and civilian employees during public transportation strikes or other stoppages. This applies only to those who are actively engaged in projects, or the support of projects, the continued delay of which would adversely affect national defense. Reasonable rates of fare shall be charged for such service and accounted for as described in paragraph 13-3 preceding. Routine construction, repair, or overhaul of aircraft, ships, or material peculiar to the Navy will not qualify under this policy. When public transit strikes or other work stoppages are imminent or in progress, Commanding Officers who determine that transportation between domiciles and places of employment is essential shall submit the following information to SECNAV, with NAVFACENGCOM as a copy addressee.

- a. Installation or activity requiring transportation support.
- b. General nature of the transportation requirements, including efforts to induce private facilities to provide the necessary transportation.
- c. Titles of critical projects.
- d. Availability, type, and number of vehicles required.
- e. Number of personnel, by project, to be transported.
- f. Proposed fares.

13-7. Operation of Ambulances.

- a. Policy. The following rules, which are based on Bureau of Medicine (BUMED) instructions, shall be strictly adhered to in relation to the operation of Medical Department ambulances.

b. Use of Ambulances.

(1) Ambulances shall be used only for the transportation of such wounded or injured persons who are eligible by law, regulation, or humanitarian consideration for treatment in Medical Department facilities of any of the armed services.

(2) Ambulances shall not be used in lieu of other vehicles for transporting messengers, mail carriers, baggage, food, other commercial type hauling, or general use.

(3) Vehicles other than ambulances shall be used to the maximum extent practicable to provide transportation for personnel between remote sections of an activity, or between adjacent activities, for routing medical and dental examinations or treatment, including x-rays, laboratory tests, and dental treatment.

c. Authorization of Emergency Runs. Only personnel delegated by the Commanding Officer may authorize emergency runs, and these authorizations must be in writing. When emergency runs are authorized, that fact with a brief report on the necessity for the run shall be fully recorded in the duty log of the cognizant Medical Department.

d. Ambulance Speed Limits. All State laws, municipal ordinances, and local command orders and instructions relating to operations of motor vehicles shall be strictly observed.

e. Use of Ambulance Warning Lights and Sirens. Warning lights or sirens are to be used only on authorized emergency runs. The use of the siren and the red light shall be governed by local laws and command regulations. It is emphasized that the use of the siren or red light in emergencies does not give the ambulance operator the authority or privilege to violate local traffic regulations. Each designated ambulance operator shall be required to acknowledge in writing that this fact has been brought to his attention.

f. Ambulance Driver Qualifications. All ambulance drivers, whether civilian or military personnel, shall have a valid U.S. Government Motor Vehicle Operator's Identification Card (SF 46) in his possession while operating ambulances. In addition, ambulance drivers must satisfy State and municipal requirements as to age and other qualifications (see Chapter 12). Drivers shall be fully conversant with local traffic regulations and local geography. The cognizant Transportation Officer shall satisfy himself in this respect prior to assigning personnel to drive Medical Department ambulances.

g. Operating Records and Forms. Each ambulance shall carry a book or clip board containing orders and safety precautions prescribed by the local command for the locality. Each vehicle shall also carry the Operators Report of Motor Vehicle Accident, Standard Form 91, and all drivers shall be thoroughly instructed in its proper use.

13-8. Air-Conditioning of Motor Vehicles.

a. Policy. It is Navy policy to authorize air-conditioning of motor vehicles where the vehicle involved will operate principally in geographic

areas where the number of "cooling degree days" is 700 or more during the four hottest months of the year, and the Commanding Officer of the activity concerned has determined that air-conditioning equipment is required in consideration of safety, efficiency, and economy. "Cooling degree days" are calculated by subtracting the base of 65°F from the daily average temperature (average of high and low of daily recorded temperature) with negative values being zero and summing these values for the four months. NAVFACINST 11200.12 (current edition) and Appendix D of this publication provide procedures for the proper coding of equipment requiring additional systems or equipment.

b. Air-Conditioning in Used Vehicles. Activities receiving by transfer used vehicles without air-conditioning from another activity may install air-conditioning equipment provided the criteria of the preceding paragraph are met. Vehicles must have a remaining life expectancy of 2 years and an odometer reading of not more than 40,000 miles. The vehicle must have an engine of sufficient capacity to accommodate the additional load. Air-conditioner material and installation costs are to be funded from receiving activity expense resources.

13-9. Installation of Seat Belts.

a. General. The minimum requirements for seat belt installation in Federal commercial type motor vehicles are governed by Federal Motor Vehicle Safety Standard No. 208. All commercial type vehicles assigned to naval activities from new procurement shall comply with this standard.

b. Responsibilities. Commanding Officers are responsible for ensuring that motor vehicles are provided with the most modern safety equipment and techniques. The use of seat belts is mandatory for all personnel being transported in Navy vehicles so equipped. Information concerning the availability of safety belt educational materials is available from the Commander, Naval Safety Center, Norfolk, VA.

13-10. Installation and Use of Red Lights and Sirens.

a. Warning Indicators. Warning or right-of-way indicators are required in certain vehicle and equipment operations. The installation of warning lights and sound devices shall in all cases comply with local and State regulations and laws controlling the application of such devices. Normally, such devices are procured as original equipment by NAVFACENGCOM on certain special application vehicles and equipment. The requirement for and the installation of warning devices on vehicles and equipment not so equipped by NAVFACENGCOM will be approved in writing by the Commanding Officer.

b. Responding to Emergency Calls. Military services police, fire, rescue vehicles and ambulances responding to emergency calls will use sirens and emergency warning devices only in accordance with standard operating procedures as set forth in pertinent directives, local regulations, and civil laws of the locality in which the vehicle is operated. To ensure safe operation regardless of permissible speed limits, vehicles will be operated within the limits required by road or traffic conditions.

13-11. Radio-Dispatched Taxi and Material Transportation Systems.

a. **Radio-Dispatched Taxi Systems.** Installation of radio-dispatched taxi systems in highly populated or widely dispersed activities is encouraged. Taxi service to supplement mass transportation service for official business will contribute to reductions in Class B requirements and provide for greater availability of equipment assets. Engineering Field Divisions (TEMC's) can provide assistance in determining the feasibility of installing radio-control-led taxi service. Funding for the procurement of radio equipment will be a determination of the cognizant office, bureau, or command (claimant).

b. **Radio-Dispatched Material Transportation Systems.** The use of radio-dispatched trucks and vans to pick up and deliver material, parts, and supplies is usually feasible in industrial and congested areas. These systems have potential for reducing the number of vehicles, fuel consumption, and general costs by greater utilization. The general procedures that apply to radio-dispatched taxis also apply to material systems.

13-12. Vehicle Size, Weight, and Load Limitations.

a. **Highway Use Policy.** It is the policy of the Navy to conform to State and local laws, regulations, and ordinances relating to motor vehicle weight and size limitations. Limitations on the weight and dimensions of vehicles that move over public highways are determined independently by each State and may vary considerably. Where interstate movements are involved, activity transportation directors or equivalents should ensure that they have a current vehicle size and weight limitation publication from State authorities of the States in which they plan oversize or overweight movements.

b. **State Laws.** State laws provide that no vehicle exceeding any legal limitation of weight or dimension may move over public highways unless prior permission for such movement is granted by the State or States concerned. Limitations on the weight and dimensions of vehicles are necessary to ensure safe passage over the roads and bridges and to prevent damage to highway facilities.

c. **Permits.** Vehicles exceeding the legal weight or size limitations shall not be moved over public highways by or for any agency of the Navy unless prior permission is granted by the State or States concerned.

d. **Navy Representatives Authorized To Obtain Permits.** The activity Commanding Officer shall designate an activity representative (normally the Transportation Superintendent of the Public Works Department) to maintain liaison and direct communication with the authorized State representative for the purpose of obtaining permits for movement of overweight, oversize, or special military loads in vehicles owned, leased, or rented by the Navy.

(1) The authorized representative of the activity shall, when contacting the State representative in reference to an oversize, overweight, or other special Navy vehicular movement, furnish the necessary information for a reasonable evaluation of the effects of the movement on the highway facilities involved. The information furnished shall include but not be limited to the following:

- (a) Type of equipment, with manufacturer's name if available, and pertinent accessories, gross weight, axle or track loads spacing, and the height, width, and length of the loaded and unloaded vehicle.
 - (b) The U.S. Navy identification number of all units involved.
 - (c) Origin and destination of the movement.
 - (d) Proposed date and time of the movement.
 - (e) Nature of the cargo (within security limitation).
- (2) In cases where the local activity cannot make satisfactory arrangements for a movement permit, the problem shall be referred to its cognizant EFD (TEMC) for further assistance. When unsuccessful in obtaining the necessary movement permit, the TEMC shall refer the problem to NAVFACENGC COM HQ (Code 120).

e. Records. Documentation of all negotiations with State representatives on movement permits shall be maintained in activity files.

f. Truck, Truck Tractor, and Trailer Load Ratings.

(1) Gross Vehicle Weight (GVW). Commercial trucks, including those procured by the Navy, are rated by the manufacturer by GVW. The GVW rating of a truck is the total weight of the loaded vehicle on the tires at ground contact. The GVW is the sum of the weights of chassis, body, cab, accessories, equipment, tires, fuels, lubricants, coolants, driver (estimated at 175 pounds), and the payload.

(2) Curb Weight (CW). The CW of a truck is the scale weight of the vehicle fully equipped, ready to operate, but without driver or payload. The CW includes the weights of chassis, body, cab, accessories, equipment, tires, fuels, lubricants, and coolants.

(3) Payload (PL). The PL of a vehicle is the allowable rated load that a vehicle can transport. The PL is computed by subtracting the sum of the CW and the weight of the driver from the rated GVW.

(4) Gross Combination Weight (GCW). The GCW rating of a tractor and trailer is the total weight of a fully loaded tractor-trailer unit on the tires at the ground. The GCW includes the sum of the weights of the truck tractor chassis, cab, accessories, equipment (including fifth wheel), tires, fuel, lubricants, coolants, driver (175 pounds), with the semitrailer and its payload included. In the case of a truck in combination with a towed full trailer, the GCW is the rated GCW of the truck plus the weight of the trailer and its payload.

g. Payload Weight Distribution. It is important that the PL weight be properly distributed over the body so that the percentage of weight carried by the front axle and that carried by the rear axle will be in the ratio for which the vehicle was designed (see Figure 13-2).

WRONG		RIGHT	WRONG		RIGHT	WRONG		RIGHT	WRONG		RIGHT				
	A very heavy concentrated load should not be loaded against the cab as the distribution of load may cause the frame to bend, perhaps permanently. It will also overload the front tires and may even cause a blowout on a worn tire. Hard steering will also result, and the load may be top-heavy.		A heavy concentrated load should be placed near the rear and on its long side if at all possible. Most of the load should be over the rear axle to get proper tire loading and eliminate bending of the frame.		This loading distributes an equal weight on all rear tires and eliminates twisting and stress on the frame. Uniform crosswise loading also prevents axle housing and wheel bearing over-loading.		A very heavy load should not be loaded on one side. This overloads one spring and the tires at that side. This loading could be bad enough to allow the brakes to lock on the wheels at the light side and cause flat spots on the tires or a skid on a wet surface.		This type of loading should never be permitted. The frame bends, the rear tires are very much overloaded, and enough weight is taken from the front tires to make steering almost impossible.		The proper place for the concentrated load illustrated is just ahead of the rear axle with the longest side on the floor.		This type of loading results from the use of the wrong vehicle for the job. On rough roads, such loading can result in an actual pivoting of the truck on its rear wheels, taking the front wheels entirely off the road.		A tractor-trailer combination is the proper vehicle for use in service like this. By using the proper vehicle, damage to the truck and tires, and serious accidents, may be avoided.
APPROXIMATE DISTRIBUTION OF TOTAL WEIGHT—VEHICLE PLUS PAYLOAD															

13-13. Joint Use Land Transportation.

a. Joint Use Land Transportation Policy. It is the policy to pursue to the fullest extent the objectives of the Secretary of Defense, as set forth in DOD Directive 4500.2, and as implemented by OPNAVINST 4640.3A, for the joint use of land transportation within areas outside the continental U.S.

b. Land Transportation on a Common Service Basis. Common use military-operated land transportation will be provided by the U.S. Army on a common service basis to fulfill requirements furnished by the Navy and Air Force outside the continental U.S. Naval activities, as appropriate, shall be guided by instructions of area commanders defining responsibilities for providing common user intratheater transportation, prescribing procedures for reporting requirements, and for allocating theater-assigned transportation resources. Under certain conditions, the overseas (theater) commander concerned may direct that any specific element of common use military land transportation (CULT) shall be the responsibility of the Army, Navy, or Air Force on a common service basis.

CHAPTER 14. OPERATION OF CONSTRUCTION AND WEIGHT HANDLING EQUIPMENT

14-1. Equipment Management. Sustained productive use of assigned construction and weight handling equipment is necessary to justify continued retention and ownership. Satisfactory productivity of an equipment fleet is principally achieved as a result of organized action directly controlled by technically competent and informed supervision. The details and forms of management control of an equipment fleet and its operating personnel are not specified herein because of the varied conditions and types of maintenance and construction work performed throughout the Navy. It is recognized, however, that it is the basic responsibility of each transportation department to have equipment available, and to assign equipment and operating personnel to the jobs to be performed.

14-2. Work Plan. The work plan must be based on a knowledge of the demand that occasions the workload. Initial and continuing surveys by management are necessary to determine foreseeable needs for service by the equipment fleet. A useful planning tool for this purpose is a graphic chart of projected work, adjusted each month to show the probable work demands over the next 3 months. It is expected that long range projects and work of a recurring nature will constitute most of the projected work. Scheduling equipment and operator requirements must be closely coordinated between the transportation and other departments concerned with work accomplishment.

14-3. Equipment and Personnel. Obtaining and furnishing the proper equipment and personnel to accomplish the workload is a basic function of the transportation department. Knowing the location, availability, and suitability of these resources is a practical and continuing requirement. Such information can be displayed visually on a control board or similar device. The following items are related to this control technique:

- (1) Physical inventories of equipment reflected by up-to-date record cards.
- (2) Properly marked and identified equipment.
- (3) Locator devices for personnel and equipment.
- (4) Direct and rapid means of communication, responsive to the nature of the workload.

14-4. Work Generation. The daily requirement for construction and weight handling equipment man-hours and equipment-hours of service are generated by the needs of various organizational elements of each naval activity. A current list of organizational representatives authorized to request work involving the use of equipment will be a matter of accessible reference to those who authorize or supervise equipment operations. The procedure for requesting services and for channeling such requests shall be clearly written and put in the hands of all concerned. This procedure shall be specific and clear for both routine and emergency situations.

14-5. Work Requests. Requests for work must be exact and complete. If the work is well defined, a measure of control and planning assistance is provided by outlining the time, dimensions, and extent of each job. Omissions, errors,

'and vague statements will be rectified by direct contact with personnel concerned, or by inspection of the job site before the work is authorized. A test of the clarity and usefulness of a work request is whether an equipment supervisor could use its contents, without other explanation, to plan and perform the required service.

14-6. Work Classification. The work of the equipment fleet is, in most cases, related directly to the needs of organizational elements of the naval activity or supported activities involving operations, production, supply, ordnance, public works, and similar functions. The nature of the work of these organizational elements is predominantly routine, scheduled, and orderly. There is no reason why the same emphasis on routine, scheduled, and orderly work shall not be reflected by the equipment fleet management serving these elements. The three appropriate classifications of work to be accomplished by the construction and weight handling equipment fleet can be described as "scheduled jobs," "immediate unscheduled jobs," and "deferrable unscheduled work."

a. Scheduled Jobs. If the preponderance of authorized work is not classified and handled as "scheduled jobs," intelligent planning and effective control of the equipment operating force is made needlessly difficult, if not impossible. Although most construction and weight handling equipment is mobile or portable, its uncoordinated shifting from one jobsite to another on an unscheduled, crisis basis is costly and wasteful. The application of priorities to scheduled jobs is necessary. Equipment supervisors prefer to arrange for the order and the time in which jobs should be done to conform to the best interests of their own organization and the environmental factors at the jobsite. Although this viewpoint is understandable, it shall be tempered by the needs and related commitments and schedules of the requesting group. A complex system of priorities must be discouraged.

b. Immediate Unscheduled Jobs. Management must expect the occurrence of unforeseen situations, including some of an emergency nature. These situations may require immediate and perhaps a round-the-clock use of one or several units of the equipment fleet for a short period of time. The classification of "immediate unscheduled jobs" shall apply only to unforeseen and unscheduled jobs requiring immediate performance and not likely to continue for a prolonged period. If such continuance is indicated, the jobs can be worked in with the scheduled jobs and so redesignated. Management must be conversant with the role of construction and weight handling equipment and operators in emergency and contingency plans and be prepared to commit them on an "immediate unscheduled" basis.

c. Deferrable Unscheduled Work. Special circumstances may temporarily defer essential work. Temporary lack of funds, unavailability of equipment or operators, and unfavorable environmental conditions are typical causes of deferment. Essential work shall not be deferred indefinitely. The circumstances dictating deferment shall be reviewed periodically to determine whether they remain in effect. Deferrable unscheduled work shall not be confused or identified with the normal backlog of scheduled jobs waiting to be started, or with scheduled jobs where progress has been stopped temporarily.

14-7. Job Authorization. The concept of action through the chain of command applies particularly to job authorization. Written delegation of authority

(whereby supervisory personnel are authorized to approve jobs involving construction and weight handling equipment and operators) shall be a matter of posted record. The authorizing signature on a job order or movement order means that the signator is authorized to commit those resources, is fully informed on all aspects of the job, and has approved the actions ordered. No job shall be performed without proper job authorization. When circumstances require verbal authorization, this shall be followed immediately with a written confirmation.

14-8. Job Planning. The job plan is the framework for working out the placement, operation, flow support, and interaction of the equipment. A job plan must be well thought out to avoid confusion and delay, and shall be structured to conserve materials and money. Some of the elements of a job plan are as follows.

- a. Complete specifications of the work to be done. A job order attached to the job plan will suffice if the job order is sufficiently detailed and complete.
- b. Sequence of all phases of the job.
- c. Scheduled completion time for each phase and for the overall job.
- d. Equipment requirements for each phase. These requirements can be best obtained through consultation with the transportation supervisor or his designated representative.
- e. Personnel requirements and estimated man-hours for each phase.
- f. Material requirements and estimated cost for each phase.
- g. Clearance permits, special licenses, and similar items pertinent to the job.
- h. Environmental conditions such as climate, wind, topography, drainage, soil mechanics, visibility, access roads, unusual hazards, and similar items.
- i. Record of progress in instances wherein equipment units operate singly to perform routine or repetitive tasks, rendering a job plan as such unnecessary. In such cases, the job order authorizing and defining the work can be considered the job plan for that operation.

14-9. Job Supervision. There is no substitute for competent supervision. This is especially true when field supervisors know the job plan and are technically competent to direct its accomplishment as smoothly and safely as the resources under their control permit. This on-the-scene level of management control does not relieve the operators and operating crews of their specific responsibilities. It does provide a more assured working climate and an accepted point of referral for decisionmaking beyond those required of the operators. The supervisor in the field may be considered the pivot around which otherwise independent equipment units and operators unite to form an operating team. As an aid to job supervision and management control, each activity is required to keep a record of starting and stopping time for each

job; and travel time, idle time, downtime, and fuel consumption for each equipment unit.

14-10. Equipment Selection and Application.

a. Importance of Proper Equipment Selection. The ideal basis for equipment selection and application is to acquire the most suitable equipment to accomplish each job undertaken. Economic restrictions on this ideal line of action, however, must be recognized. The high acquisition cost of construction and weight handling equipment, and the different types and conditions of work to be done, inhibit the use of the most suitable equipment for every job. Nevertheless, it is not economically sound to undertake jobs without reasonably suitable equipment. Commercial contracting firms, for example, seek jobs that can be handled effectively with their on-hand equipment inventory. Such an option is not open to naval activities, which must unfailingly perform their tasks without the privilege of accepting or rejecting the assignments. As a result, selection of the basic equipment fleet for naval activities must be made on a sound basis with regard for overall utility, flexibility, and cost.

b. Criteria for Equipment Selection. The essential considerations for justifying the acquisition of construction and weight handling equipment on a regularly assigned basis are as follows.

(1) Predictable continuing requirements must exist over a considerable period of time for stated quantities of specific types and capacities of the equipment.

(2) The continuing requirements cannot be satisfactorily and economically supplied by suitable loaned, rented, or leased items.

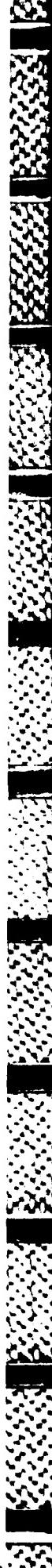
(3) The equipment acquired will efficiently perform various recurring jobs of primary importance to the activity, through the quantity, types, capacities, and attachments of the acquired units. It is of secondary importance that this equipment have the flexibility to satisfactorily perform other jobs of a nonrecurring nature.

c. Application Criteria for Specific Jobs. The process of selection requires a knowledge of the characteristic advantages and disadvantages of equipment units and attachments; the nature of the jobs they were designed to perform; and the proper size and capacity of the equipment. Compromises can be expected because of the several factors involved. The overall utility and flexibility of construction and weight handling equipment, however, can be increased by the inclusion of proper attachments, and by effective work procedures. Consideration shall be given to the use of general purpose equipment of the most versatile, multiuse type available. As an example, a tractor with front-end loader, back-hoe, and auger and trencher attachments offers maximum use of the power unit which is the primary cost factor in the procurement. In general, the following considerations apply to application criteria:

(1) Functional characteristics of equipment and attachments.

(2) Applicability to jobs to be done.

- (3) Size and capacity of equipment for the jobs.
- (4) Cost.
- (5) Standardization.



CHAPTER 15. OPERATION OF RAILWAY EQUIPMENT

15-1. Application at Naval Activities. The principal types of work performed by Navy-owned railway equipment at naval shore activities comprise movements of material and equipment within the confines of the activity itself. The nature of the equipment and material moved by rail is such that the quantity, weight, or size involved, either as single units or in the aggregate, is large enough to make the use of railway equipment essential. Aside from the nature of the items to be hauled, continued operation of railway equipment means that there are consistent and regular demands for movement of materials by rail.

15-2. Work Areas. The railway service area and traffic pattern vary considerably among naval shore activities. Shipyards usually present a congested complex within a limited and heavily traveled area. Ordnance and weapons facilities may extend for miles in a relatively open area where careful operation is influenced by the nature of the cargo rather than by the traffic pattern. Aviation shore activities, naval stations, supply depots, and other installations range in size and congestion between the extremes mentioned. Limited areas at certain naval shore activities does not mean that operation of railway equipment at these activities is confined to yard service within yard limits. A yard in railway terminology is a system of tracks within defined limits, provided for the making up of trains, storing of cars, and other purposes, over which movements not authorized by timetable or by train order may be made, subject to prescribed signals and rules or special instructions. Considerable movement of working railway equipment at naval activities is controlled by train order or verbal order of the train dispatcher regardless of the area involved. Much of the dispatcher-controlled operation is main line in nature.

15-3. Equipment Types. Railway equipment in use at naval activities consists of railway locomotives, railway locomotive cranes, and various types of standard and specialized railway cars. Most railway locomotives used by the Navy range from the 20-ton to the 120-ton class and are powered by diesel electric engines. Railway cars include the usual standard types such as flat, gondola, box, tank, hopper, passenger, and caboose.

15-4. Operating Organization. The principal elements of the railway operating organization at naval shore activities are the supervisory control group, operations control group, train crews, and yard group. Although various terms can be used to describe these organizational groups and the personnel who perform the operating functions, their responsibilities and duties are generally similar at all shore activities that operate railways. For example, the responsibilities of conductors are substantially the same at all activities even though their specific duties may differ in detail. This similarity applies to the other operating positions, such as engineman, brakeman, dispatcher, and yardmaster. At a few shore activities the railway operations, although necessary, are so limited that, with the exception of the train crew, it may not be necessary to fill all the positions described in this section. Under such circumstances it is conceivable that one person could assume the responsibilities of the supervisory control group and yard group, while another person could do likewise for the operational control group. It should be noted that the contents of this chapter are directed toward the size and type of an operating organization usually required for the more extensive railway operations within the Navy. Readable copies of a functional

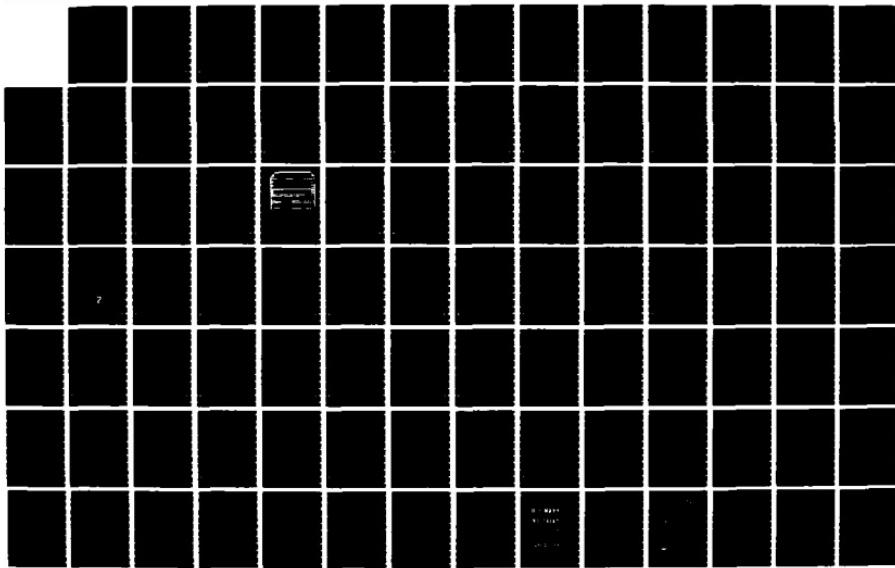
RD-R171 129 MANAGEMENT OF TRANSPORTATION EQUIPMENT(U) NAVAL
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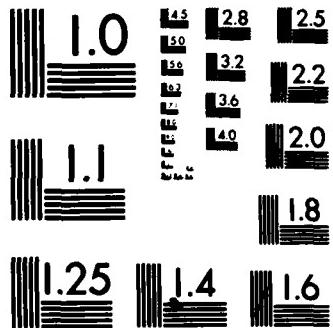
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organization chart should be posted on all bulletin boards in the railway administrative and operating areas. The charts should be kept current and should show the names of all railway operating personnel and the positions they hold in the railway organization.

a. Railway Operating Procedures. Railway operating rules and procedures will be available in a new limited distribution publication titled "Navy Railway Operating Handbook" to be released separately at a later date to activities having a railway operation.

15-5. Supervisory Control Group. The extent of an activity railway operation has an important bearing on the division of responsibility and the number of personnel assigned to the supervisory control group. Because of the limited nature of railway operations at most shore activities, it is seldom that more than two supervisors would be required to handle the responsibilities and duties of the supervisory control group.

a. Trainmaster. Trainmasters exercise general supervision over all personnel in train and engine service. In case of accident or interruption to traffic from any cause, the trainmaster in cooperation with the chief train dispatcher will take personal charge of the situation until normal conditions are restored.

b. Chief Train Dispatcher. Chief train dispatchers have overall charge of the movement of trains and the proper distribution of cars. They supervise train dispatchers, signalmen, and other personnel attached to the operations control group.

c. Road Foremen of Engines. Road foremen of engines exercise supervision over personnel in engine service insofar as engine and train handling are concerned. It is their duty to ride engines frequently and guide enginemen and firemen in the proper performance of their duties and the economical use of fuel and supplies.

d. Duties of the Supervisory Control Group. It is the duty of supervisory control group personnel to make certain that the following actions are accomplished.

(1) Train crews are ready for departure at designated times.

(2) Track and equipment are in safe and acceptable operating condition, and that all defects are reported immediately.

(3) Cars are inspected regularly and repaired promptly.

(4) Transfer cars are placed properly, without delay, to avoid stoppages and confusion in freight movement.

(5) Records and reports are kept and furnished, as required, on all engines, cars, and equipment, and their movement.

(6) Train crew time is checked regularly to make sure that only the necessary number of engines and crews are being used.

(7) Written reports of incidents or accidents are furnished promptly by dispatchers, conductors, or other operations control and train crew personnel, as appropriate.

(8) Investigations are made personally, by one or more of the group to: determine the prime cause and contributory factors of incidents or accidents; fix responsibility for their occurrence; and take immediate corrective measures.

15-6. Operations Control Group. The operations control group consists primarily of train dispatchers and communications operators. It is consistent with railway operations at some shore activities to combine the responsibilities and duties of this group under the position of train dispatcher.

a. Responsibilities. Major responsibilities of the Operations Control Group are as follows.

(1) Prepare and issue orders governing the movement of trains in accordance with officially established rules.

(2) Control the right-of-way of all engines, trains, and any other equipment using the roadbed of the railway.

(3) Record the movement of all trains and the highlights of important incidents affecting railway traffic.

(4) Observe passing trains or engines, exchange signals as prescribed in official rules, and record or advise the chief train dispatcher of all exceptions noted.

b. Working Rules. The following working rules apply to the Operations Control Group.

(1) The group must know about the movements of railway equipment and obstructions to the right-of-way of such equipment.

(2) Keep informed of time of departure, time of arrival, and any other pertinent information required to coordinate all railway movements safely and efficiently.

(3) Centralize dispatching authority, especially the issuing of orders for the movement, shifting, or spotting of railway equipment.

(4) Issue train movement orders to personnel in charge of engines, trains, and any other equipment using the roadbed of the railway.

(5) Determine the priority of trains, engines, or other equipment using the roadbed outside of yard areas.

(6) When the situation warrants, authorize a conductor to proceed as conditions will allow. Acceptance of such an order by a conductor means that he assumes responsibility for the safe operation of such movement.

(7) Receive and authorize duly approved requests for temporary obstructions to the railway roadbed.

(8) Receive notification of deficiencies, incidents, and accidents. Notifications of accidents should be sent by the speediest means available.

(9) Inform the supervisor in charge about accidents, deficiencies, or incidents that have interfered with, or might interfere with, the safe operation of the railway system. Such reports shall be made by the fastest means available; verbal reports shall be followed by written reports as soon as possible.

(10) Require notification of followup action taken to correct deficiencies previously reported.

(11) Require notification of the status of salvage operations on wrecks or derailments.

15-7. Train Crews. Train crews consist of conductors, enginemen, and brakemen. Differences in staffing occur because of the varied nature and extent of the railway operation at shore activities. With regard to composition of train crews, Safety Precautions for Shore Activities (NAVMAT P-5100), requires that a train crew at an activity shall consist of not less than one locomotive engineer and three trainmen unless other arrangements have been approved by the safety division of the command having management control of the activity. For the protection of all concerned, this approval should be on file at the applicable naval shore activity.

a. Conductor. The conductor reports directly to a railway operations supervisor. He will comply with instructions of train dispatchers, and yard-masters, within their respective jurisdictions. Engineers and brakemen comply with instructions of the conductor in the general actions relating to trains. While on duty on trains or in yards, brakemen are under the direction of the conductor.

(1) Responsibilities of the Conductor. The conductor has the following responsibilities.

- (a) Movement, safety, and proper care of his assigned train.
- (b) Proper placement and performance of the train crew.
- (c) Vigilance and conduct of the crew.
- (d) Preparation, inspection, and condition of his train.

(2) Working Rules. The following working rules apply to the conductor. He shall:

- (a) Not allow other duties to interfere with necessary precautions for the protection of the assigned train.
- (b) Require trainmen to act promptly in accordance with established rules.

- (c) Inform the train crew immediately of all instructions and movement orders, and make certain that all crew members understand these orders and instructions.
- (d) In the absence of car inspectors, and with the assistance of trainmen, thoroughly inspect all cars offered and be sure of their safe condition before moving them.
- (e) Inspect the running gear, brake, and draft rigging, and observe the general condition of the train as closely and as often as practicable while moving or standing.
- (f) Set sufficient hand brakes and block the wheels of all cars left on sidings.
- (g) Entrust the duties of flagging only to persons familiar with such duties and give as complete instructions in such duties as circumstances permit.
- (h) Report immediately to the train dispatcher the nature and extent of any incident that prevents assignments and movement orders from being carried out, and request clarification of orders before proceeding.
- (i) Refuse to accept cars that are unsafe to run, or are loaded beyond their authorized capacity, or whose loading is not properly secured; and report this action to the dispatcher.

b. Enginemen. An engineman reports directly to the trainmaster and to the road foreman of engines, as applicable.

(1) Enginemen shall comply with instructions received from personnel in the following positions.

(a) Supervising mechanic, in matters pertaining to operation of locomotives.

(b) Train dispatchers and yardmasters, in matters within their respective jurisdictions.

(c) Conductor, in the general actions relating to the train, unless the safety of the train would be endangered, or the rules would be violated.

(2) Responsibilities of Enginemen. An engineman has the following responsibilities.

(a) Control and care of the engine in his charge.

(b) Economical use of fuel and supplies.

(c) Assumption of control of the train in the absence of the conductor, during which time the engineman shall be governed by the rules prescribed for conductors.

(3) Working Rules. Working rules for enginemen are as follows.

(a) Make sure that the engine and the train are in safe operating condition and that all essential supplies, tools, and signals are on hand before starting on any run.

(b) Request, before proceeding, clarification of orders from the conductor whenever in any doubt as to their intent.

(c) Keep a constant and vigilant lookout; carefully note all signals, whether other trains are displaying signals, position of switches, and obstructions in track; and especially, when rounding curves, look back to note whether the train is intact, and if there is any indication of hot boxes.

(d) Notify the conductor immediately of any condition prejudicial to the safety of the train and request further orders before proceeding.

(e) Sound whistle signals accurately.

(f) Sound the bell continuously while engine is in motion in specifically designated areas, and refrain from sounding the bell when not in motion or just starting to move in such areas.

(g) Be alert in all matters pertaining to the protection of the train and signal out the flagman when it becomes evident that rear protection is required.

(h) Stop the train when hand or other signals become unreadable, and do not proceed until they become clear again.

(i) During foggy or stormy weather, take extraordinary precautions at switches and all other places where authority to proceed depends on signals.

(j) Regulate the starting and stopping of the train to avoid all damage.

(k) Be careful during heavy rain or high water when approaching bridges and other parts of the road likely to be damaged and be sure the track is safe.

(l) Make certain that air brakes and air signal appliances, if in use on the train, are connected between engine and train and between engines when double-heading.

(m) Avoid, so far as possible, the slipping of driving wheels.

(n) Allow only authorized persons to ride the engine.

(o) Remain with engine while on duty, but in case of necessity, leave the brakeman or some other competent person in charge.

c. Brakemen. Brakemen at naval shore activities perform the functions of flagmen and of switchmen, as required. A brakeman reports directly to the

trainmaster, or to other specifically designated person in the supervisory control group (paragraph 15-5). He shall comply with instructions of train dispatchers and yardmasters within their respective jurisdictions. While on duty on a train or in a yard, a brakeman is under the direct control of the conductor.

(1) Responsibilities of Brakemen. A brakeman is responsible for the following functions.

(a) Protecting the train.

(b) Coupling and uncoupling cars and engines.

(c) Positioning switches as required and returning them to their proper position after use.

(2) Working Rules. The following working rules apply to brakemen.

(a) Assist the conductor in the handling of the train to protect it from damage and guard it against loss.

(b) Notify the conductor immediately of any condition prejudicial to the safety of the train.

(c) Obey all signals from the engineman.

(d) Take action to protect the train when necessary, without waiting for signals or for orders from the conductor.

(e) Put markers and other rear signals in place and see that they are in proper condition.

(f) Obtain permission from the conductor to leave the designated location, except when necessary to protect the train.

(g) See that brakes, steps, handholds, ladders, and running boards of cars in the train are in good condition and report any defects to the conductor.

(h) When acting as a flagman, take up a station at least 150 feet from the end of the train or engine that needs protection.

15-8. Yard Group. The yard group consists of a yardmaster, yard conductors, and yard switchmen. At shore activities with extensive operations there may be more than one yard. A yard in railway terminology is a system of tracks within a specified area marked by yard limits. At activities with limited railway operations there may be no yard personnel as such, aside from the yardmaster. Under these conditions, train crews and other railway personnel function as members of the yard group under the supervision of the yardmaster during the time they are operating in the yard area.

a. Yardmaster. The yardmaster reports directly to the trainmaster and will comply with instructions of the chief dispatcher, or other specifically designated person in the supervisory control group. Yardmasters have charge

of yard conductors, yard switchmen, and other yard personnel. When within yard limits, enginemen and trainmen report directly to the yardmaster.

(1) Responsibilities of the Yardmaster. The yardmaster is responsible for the following functions.

(a) Performance of personnel, movement of trains and engines, and distribution of cars within the yard.

(b) Proper classification and prompt movement of cars within the yard.

(c) Proper makeup and prompt dispatch of trains from the yard.

(d) Inspection of cars within the yard and proper disposition of cars that need repairs.

(2) Working Rules. The following working rules apply to yardmasters.

(a) Make certain that engines and crews are ready at the appointed time.

(b) Check the time of yard crews, certify to its correctness, and see that no more engines and crews are used than are actually required.

(c) Be familiar with the rules governing the movement of trains and the duties of personnel.

(d) Keep informed of the movement of trains and expedite their passage through the yard.

(e) Be familiar with every rule and limitation in force at the activity pertaining to the makeup of trains, and make certain that these rules and limitations are complied with in detail.

(f) Make sure that cars to be transferred are placed promptly, and avoid all unnecessary delay to freight.

(g) See that doors of all box cars are closed, tightly secured, and sealed when required, and that all outward-swinging hinged doors are closed whether the cars are empty or not.

(h) After informing the trainmaster, submit a written report to the supervisory control group about accidents, deficiencies, or incidents that have interfered with, or that might interfere with, the safe operation of railway equipment within the yard.

b. Yard Conductor and Yard Switchman. The yard conductor and yard switchman report to, and receive instruction from, the yardmaster. The yard switchman shall follow instructions issued by the yard conductor. The yard conductor determines in advance the best possible switching plan, and sees that this plan is followed. The yard switchman and other yard personnel perform their work in accordance with official rules and special instructions issued by competent authority.

CHAPTER 16. GENERAL TRANSPORTATION MAINTENANCE MANAGEMENT

16-1. Basic Maintenance Objectives. The basic objectives of the Transportation Maintenance Management Program are to provide at the lowest possible cost:

(1) Maximum availability of safe and reliable equipment, thus reducing the capital investment needed for providing effective and efficient transportation service.

(2) Ensure the maximum economic service life of the equipment, thus reducing the capital replacement cost.

16-2. Program Elements. To accomplish the basic maintenance objectives efficiently and effectively, the application of management principles, procedures, and techniques for planning, organization, direction, coordination, control, and evaluation of results have been incorporated into the Transportation Maintenance Management Program. These have been included in the following basic program elements which are developed in detail in this chapter.

a. Planning and Scheduling. Provides for the establishment of a complete and accurate inventory record of the equipment to be maintained; a preventive maintenance schedule that will ensure safe, serviceable equipment and a uniform shop workload.

b. Organization and Facilities. Establishes the necessary organizational structure to ensure the efficient accomplishment of the maintenance workload through proper direction, supervision, and control of the work force.

c. Coordination. Provides for the necessary coordination with the supply and fiscal organizations for material support and accounting service, and with other organizations for coordination support.

d. Control. Provides procedures and standards for the control of work input, direct labor productivity, overhead, material, downtime, and overall maintenance cost.

e. Reports and Performance Evaluation. Provides a uniform system of cost and statistical accounting, together with management indices to evaluate all phases of the program in sufficient detail to determine those elements needing corrective action, and provides a data base for transportation maintenance budget projections.

16-3. Levels of Maintenance. There are three levels of maintenance recognized in the Department of Defense, and applicable to Civil Engineering Support Equipment (CESE). These are "Organizational," "Intermediate," and "Depot" and are defined in Appendix A. Normally, naval shore activities will perform Organizational and Intermediate type maintenance. Depot level maintenance will not be performed on CESE unless restoration is specifically approved by NAVFACENGCOM.

16-4. Commercial Contract Maintenance. It is the Navy's policy to perform maintenance in its own facilities or by commercial contract, whichever is the most economic method consistent with the optimum availability of equipment. The use of commercial contract shall be evaluated periodically using the

commercial industrial evaluation procedures set forth in the Office of Management and Budget (OMB) Circular A-76 (see paragraph 12-6.) The use of commercial contract should be particularly investigated for the repair and rebuild of reparable components such as engines, transmissions, rear axles, electrical components, and cooling system components where specialized skills, tooling, and equipment are required and the volume generated by the activity is not sufficient to support the specialized capability.

16-5. Maintenance at Small Activities. Small activities having vehicle and equipment inventories too small to economically justify the specialized skills, tools, and equipment to properly maintain the equipment should arrange to have the maintenance performed either by another Government activity or commercially. The using activity is responsible for funding all maintenance. Where the maintenance is of recurring nature, interservice/intraservice support agreements should be established with the performing Government activity. Where the activity cannot obtain maintenance from a Government activity, or service is not responsive, the procedure should be to procure services from commercial sources.

16-6. Maintenance Planning and Scheduling.

a. Requirement. Effective and economic preventive maintenance services require a systematic scheduling program that will make equipment available for mechanical and safety inspections, lubrications, adjustments, and necessary repairs at predetermined intervals. Thus, downtime and resultant costly disruptions of transportation operations work schedules because of equipment failures are reduced. In addition, effective planning and scheduling will ensure that the major portion of the shop workload will be uniform and balanced, reducing the required work force and increasing the application of the work force to productive effort. It should be recognized that there is an economical point at which the random failures of equipment can be reduced by preventive maintenance.

b. Procedures. Detailed procedures for the planning and scheduling of preventive maintenance are set forth in Chapter 17. These procedures include, in addition to those functions of the Transportation Division, the equally important functions of the drivers, operators, and the service station in accomplishment of effective preventive maintenance.

c. Management Action. The Transportation Division Director shall review actual performance against planned schedules and take appropriate corrective action in the following cases.

(1) Where actual miles or hours between inspections indicate equipment is being inspected or serviced too frequently or not frequently enough, resulting in over or under maintenance.

(2) Where analysis of unscheduled work indicates faulty inspection or driver abuse.

(3) Where activities are not turning in vehicles for inspection and service on scheduled dates.

16-7. Maintenance Organization and Staffing.

a. Standard Organization. Effective maintenance at an activity requires an organizational structure with duties, responsibilities, and authority clearly defined. Supervision can then effectively direct and control the accomplishment of work. In addition, the organization must be adequately staffed and provided with the facilities and resources required. The general organization and functions of the Transportation Division, including the Operations, Production Control and Equipment Maintenance Branches, are described in paragraph 12-1. A detailed description of the Equipment Maintenance Branch follows.

b. Equipment Maintenance Branch. The Equipment Maintenance Branch Head reports to the Transportation Division Director. Briefly, the Branch Head's responsibility is to ensure that all vehicles and equipment are maintained in a safe and reliable condition, and that the time during which vehicles and equipment are out of service (downtime) is kept to the minimum. Further, it is his responsibility to ensure that maintenance is performed in a cost effective manner, and that the cost of such maintenance is accomplished within the Transportation Division's budget plan. The Maintenance Branch is normally organized into one or more repair sections, when the division has a separate Production Control Branch. Each section head reports to the Maintenance Branch Head. Functional responsibilities of these sections are as follows:

(1) Repair Section(s).

(a) Performs work prescribed on SRO's. Brings to the inspector's attention, for further work authorization, added deficiencies requiring correction disclosed during accomplishment of work.

(b) Accomplishes work on SRO within established job operation time standards (manufacturer's flat rate).

(c) Keeps overhead and indirect time at a minimum, allocating such time within established standards.

(d) Confines the use of repair parts to a level necessary to achieve effective repairs, holding material costs within overall established budget standards.

(e) Performs final inspection and test to ensure that the work has been properly accomplished and that the equipment is safe and reliable.

c. Equipment Maintenance Branch. (operating without a separate Production Control Branch). The Equipment Maintenance Branch Head reports to the Transportation Division Director. Briefly, the Branch Head's responsibility is to ensure that all vehicles and equipment are maintained in a safe and reliable condition, and that the time during which vehicles and equipment are out of service (downtime) is kept to the minimum. Further, it is his responsibility to ensure that maintenance is performed in a cost effective manner, and that the cost of such maintenance is accomplished within the Transportation Division's budget plan. The Maintenance Branch is normally organized into a control section and one or more repair sections. Each section

head reports to the Maintenance Branch Head. Functional responsibilities of these sections are as following:

(1) Control Section.

(a) Maintains the inventory, schedules maintenance, receives all equipment, makes inspections and estimates, and routes all maintenance work and shop repair orders (SRO) (NAVFAC Form 11200/3A) to the repair section supervisor(s) for work accomplishment.

(b) Inspects all equipment and prescribes and approves in writing on an SRO the maintenance work to be accomplished.

(c) Allocates on an SRO the job operation time standards (manufacturer's flat rate standard) to be used in measuring the repair section's productivity.

(d) Performs all shop accounting functions, including completion of labor distribution cards' reconciliation with time cards.

(e) Maintains all equipment history record files.

(f) Provides the Equipment Maintenance Branch head with status reports such as downtime status, labor expended against standards, productivity of the repair section(s), and performance against maintenance input and overhead standards.

(g) Develops, revises, and adjusts all preventive maintenance schedules, including items to be inspected, frequency, and necessary depth and detail.

(h) Expedites work through the shop(s), including parts for vehicles out of service awaiting parts (OSP).

(i) Advises customers when work has been accomplished, and provides necessary status information.

(2) Repair Section(s).

(a) Performs work prescribed on SRO's. Brings to the inspector's attention, for further work authorization, added deficiencies requiring correction disclosed during accomplishment of work.

(b) Accomplishes work on SRO within established job operation time standards (manufacturer's flat rate).

(c) Keeps overhead and indirect time at a minimum, allocating such time within established standards.

(d) Confines the use of repair parts to a level necessary to achieve effective repairs, holding material costs within overall established budget standards.

(e) Performs final inspection and test to ensure that the work has been accomplished and that the equipment is safe and reliable.

d. Staffing. Staffing requirements can be determined from the maintenance man-hour input standards set forth in Appendix H. These factors applied to the miles or hours operated by the activity develop the required staffing needed to maintain the vehicle and equipment in a safe and serviceable condition. Applying labor rates and material factors to these man-hours can develop funding requirement.

16-8. Maintenance Coordination.

a. Coordination Requirement. Management attention and action must be constantly directed to the important function of coordination, both within the Transportation Division and Public Works Department and with other departments within the activity. A failure of proper coordination can result in a serious breakdown in the effectiveness of the maintenance program and result in excessive costs.

b. Supply and Fiscal Department Coordination. The Supply and Fiscal Department provides the material support and cost accounting services to the Transportation Division. Paragraph 18-4 describes in detail the necessary coordination in the area of repair parts support. NAVCOMPT Manual, Volume 3, Chapter 7, Transportation Equipment Cost Accounting, presents the responsibilities of the Supply and Fiscal Departments with respect to cost accounting and report preparation. The Transportation Division Director shall be completely familiar with the NAVCOMPT Manual, Volume 3, Chapter 7 and maintain necessary liaison with the Supply and Fiscal Departments to ensure accurate and timely data and reports. In addition, the Division Director shall review the operation of the service stations if operated by the Supply Department to ensure that the service stations are performing certain preventive maintenance functions correctly.

c. Operations Branch and Other Using Departments. Proper preventive maintenance and efficient shop loading programs require that maintenance schedules be met. However, such schedules must be compatible with the equipment requirements of the Operations Branch and other using organizations. The Division Director shall see that the schedules are realistic, coordinating them through the using organizations. Schedules shall be flexible to the extent that operational requirements are met.

CHAPTER 17. MAINTENANCE, PLANNING, CONTROL, AND PERFORMANCE EVALUATION

17-1. General Plan. The basic policies and procedures for the financial management of the Navy are prescribed by the Comptroller of the Navy and set forth in NAVSO P-3006-1, Financial Management of Resources. This system is designed to provide the department heads of activities and their subordinates with the basic information necessary to develop an operating plan (including a transportation plan) which will efficiently manage the O&MN resources made available. Effective transportation management depends on the development, approval, and execution of a realistic and cost effective budget plan. In order to execute such a plan, all levels of management require timely and frequent feedback reports on the basic elements of transportation maintenance and operations:

- (1) Allowance to inventory balance
- (2) Equipment downtime
- (3) Equipment utilization
- (4) Maintenance man-hour input
- (5) Direct labor productivity
- (6) Indirect labor (overhead)
- (7) Repair parts and material expenditures

The foregoing elements must be monitored constantly to ensure that the budget plan is being followed; and that the mission of providing safe, reliable, and efficient transportation support services is being accomplished.

17-2. Budget Plan. Each transportation director shall be responsible for developing the Transportation Division (or Department) portion of the activity budget plan. Appendix H provides guidance on a uniform system for the preparation of a planned transportation maintenance direct and indirect labor and material budget. Figure H-1, Appendix H, is a sample worksheet which should be used in preparation of the budget plan. Preparation of the operations portion of the plan should be based on historical data and current operational requirements. The standards presented in Appendix H, Table H-1, cover the direct labor necessary to maintain a unit in a safe and reliable condition throughout the economic service life. These standards include the necessary labor hours to lubricate, service, clean, wash, install tires and batteries, remove, repair, and replace major/minor components, subassemblies, parts, and accessories, except those resulting from accidents. The standards do not cover extensive one-time major overhaul and rebuild of the complete unit of equipment.

17-3. Transportation Reports. The primary formal information system available to transportation management is the NAVCOMPT Form 2168, Operating Budget/Expense Report (Figure 17-1) and the NAVCOMPT Form 2169, Performance Statement (Figure 17-2). Details of these reports are provided in NAVSO P-3006-1. These or other similar formatted, tabulated data should be provided monthly by the activity comptroller/fiscal officer from the activity accounting system as

OPERATING BUDGET/EXPENSE REPORT

Comptroller Dept.		Public Works Dept.		BUDGET ORGANIZATION		APPROPRIATION DATA		COST CENTER		TRANSPORTATION		CUMULATIVE EXPENSES		FOR PRIOR FINANCIAL PERIOD	
func/ org. cat.	cost account cat.	func/ cost code	description	work units	main military	civilian	military services	civilian labor	military supplies	contract	other	total	initial exp.	total	initial exp.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
L-7	62A2	0102	Sedan	2		4.8		44	31	25					100
	62A3	0103	Sedan	1		2.4		26	16						42
	62B0	0061	Bus 20 pass.	3		21.0		194	136						330
	62B0	0063	Bus 37 pass.	4		28.0		259	182						461
Total	62B0			7		49.0		453	318						771
L-7	62E0	0200	Sta. wagon	2		4.8		44	31						75
	62E0	0202	Sta. wagon	1		2.4		26	16						42
	62E0	0210	Sta. wagon	3		7.2		67	47						114
Total	62E0			6		14.4		137	94						231
L-7	62F0	0205	Ambulance conv. 4x2	1		5.9									
	62G0	0313	Trk. pickup 4x2	15		42.0		388	273	20					681
	62G0	0316	Trk. pickup 4x4	10		28.0		259	182						461
Total	62G0	0319	Trk. pickup compact	5		14.0		129	91	15					235
L-7	62H0	0308	Trk. utility comm. 4x2	2		7.0		65	45						110
	62H0	0311	Trk. carryall 8 pass.	3		10.5		97	68						165
	62H0	0315	Trk. multistop 4x2	5		17.5		162	114						276
Total	62H0			10		35.0		324	227						551
	62I0	0341	Trk. panel 4x2	3		13.2		122	86						208
	62I0	0342	Trk. cargo pickup 4x2	2		8.8		81	57						138
Total	62I0	0343	Trk. cargo stake 4x2	4		17.6		163	114						277
						39.6		366	257						623

NOTE TO BUDGET FORM (e-7)

Figure 17-1
Sample Operating Budget/Expense Report

PERFORMANCE STATEMENT

FROM			TO			APPROPRIATION DATA			FOR PERIOD ENDING			REPORTING FISCAL OFFICER (Signature and Rank)														
Controller Department			Public Works Department			CONTRACTOR			15 October 1976			John J. Doe CDR.														
BUDGET FOR			BUDGET GRANTOR			DATE OF SUBMISSION																				
BUDGET CLASSIFICATION																										
EXPENSES																										
BUDGET CLASSIFICATION	ITEM/COST SUBDIVISION	DESCRIPTION	ACTUAL	ANNUAL BUDGET	NORM 8.7% % TO BUDGET	ACTUAL	ANNUAL BUDGET	% IN	WORK UNITS	ACTUAL UNIT COST	% IN BUDGET	IN	STANDARD UNIT COST	IN												
ITEM/COST SUBDIVISION	COST ACCOUNT	ITEM/COST SUBDIVISION	(14)	(15)	(16)	(17)	(18)	(19)	IN	IN	(11)	IN	IN	(11)												
6210	Maint Sedans	1,092	3,900	28	26,000	130,000	20	20	.0620	.0337	26	.0337	.0330	.0330												
6220	Maint Pick-Up Trucks	7,656	30,625	25	227,500	875,000	31	31	.2193	.12,575	31	.2193	2.266	2.266												
6450	Maint Const Equip	8,550	28,500	30	3,898	12,575	25	25	.800	975	25	.800	11,000	11,000												
6510	Maint Weight Hand	8,350	42,900	20	975	3,900	--	--	--	975	--	--	--	--												
6530	Operation Sedan	780	3,900	20	1,733	8,666	20	20	.0000	1,733	20	.0000	.0000	.0000												
6530	Operation Pickup	10,236	39,330	26	22,724	87,400	26	26	.0000	22,724	26	.0000	.0000	.0000												
6710	Drivers/Chauffeur	77,000	308,000	25	--	--	--	--	--	--	--	--	--	--												
6910	Supervision	10,557	47,988	22	--	--	--	--	--	--	--	--	--	--												

Figure 17-2
Sample Quarterly Performance Statement

required by NAVSO P-3006-1. The essential information provided by these reports and their recommended functional use by the transportation managers are as follows.

17-4. Evaluation of Reports.

a. Operating Budget/Expense Report, NAVCOMPT 2168. The NAVCOMPT 2168 report provides management with details as to work units completed, man-hours, and accrued expenses, cumulative to date by equipment cost code, and summarized by each budget cost account line item. Using the monthly NAVCOMPT 2168 and records maintained by the activity transportation organization, i.e., allowance, inventory, work units, downtime, etc., an analysis can be made to determine if the transportation organization is meeting the plan and what elements may be causing a deviation from the approved budget plan. A suggested budget troubleshooting chart is provided (Figure 17-3) to aid the transportation division director in analyzing his budget performance.

b. Performance Statement, NAVCOMPT 2169. The NAVCOMPT Form 2169 (Figure 17-2) is designed to provide management with the actual fiscal year to date totals for accrued expenses and work units for each cost account line item and the percentage of the budget amount. In theory, a uniform expenditure rate is about 8.3 percent per month. While the actual expenditures for individual cost accounts may vary from the uniform rate, the transportation director should analyze the significance of any variance from the uniform rate and take corrective action when appropriate. Similarly, the report provides the number of work units performed for each cost account number and the to-date percentage of the planned work units related to the budget. For example, in theory if 8.3 percent of funds for maintenance were expended in the first month, then 8.3 percent of the planned work units (miles/hours) should also have been accomplished, since this was the basis of the budget amount. Here again the transportation director must analyze the variance and take necessary corrective action.

17-5. Allowance Control. Control of inventory to allowance is necessary if the transportation director is to function within the operating plan and established standards. Maintenance and operating costs for equipment in excess of approved allowance place undue drain on planned O&MN funds in the budget plan. Since the approved equipment allowance is the basis for the transportation budget, every effort must be taken to remove equipment from service within 15 days after replacement equipment is received. Retaining equipment in excess of allowance also adversely affects NAVFACENGCOM's position in justifying the procurement of replacement equipment.

17-6. Equipment Downtime. Transportation equipment downtime is based on a 24 hour day, 365 day year. The maximum acceptable standard downtime is normally 10 percent of the total hours which equates to 10 percent of the fleet out of service (OS) for maintenance at any given time. The demand hours based on a 24 hour day, 365 day year is 8,760 hours per year. Within the 10 percent downtime, some 3 percent can be expected to be out of service awaiting maintenance (OSW), another 3 percent out of service being worked on (OSM), and some 4 percent out of service awaiting parts (OSP). The terms "out of service" and "deadlined" have identical meaning. For transportation cost reporting purposes, the total downtime will be shown. Downtime hours shall begin when the vehicle/equipment is removed from service and end when the

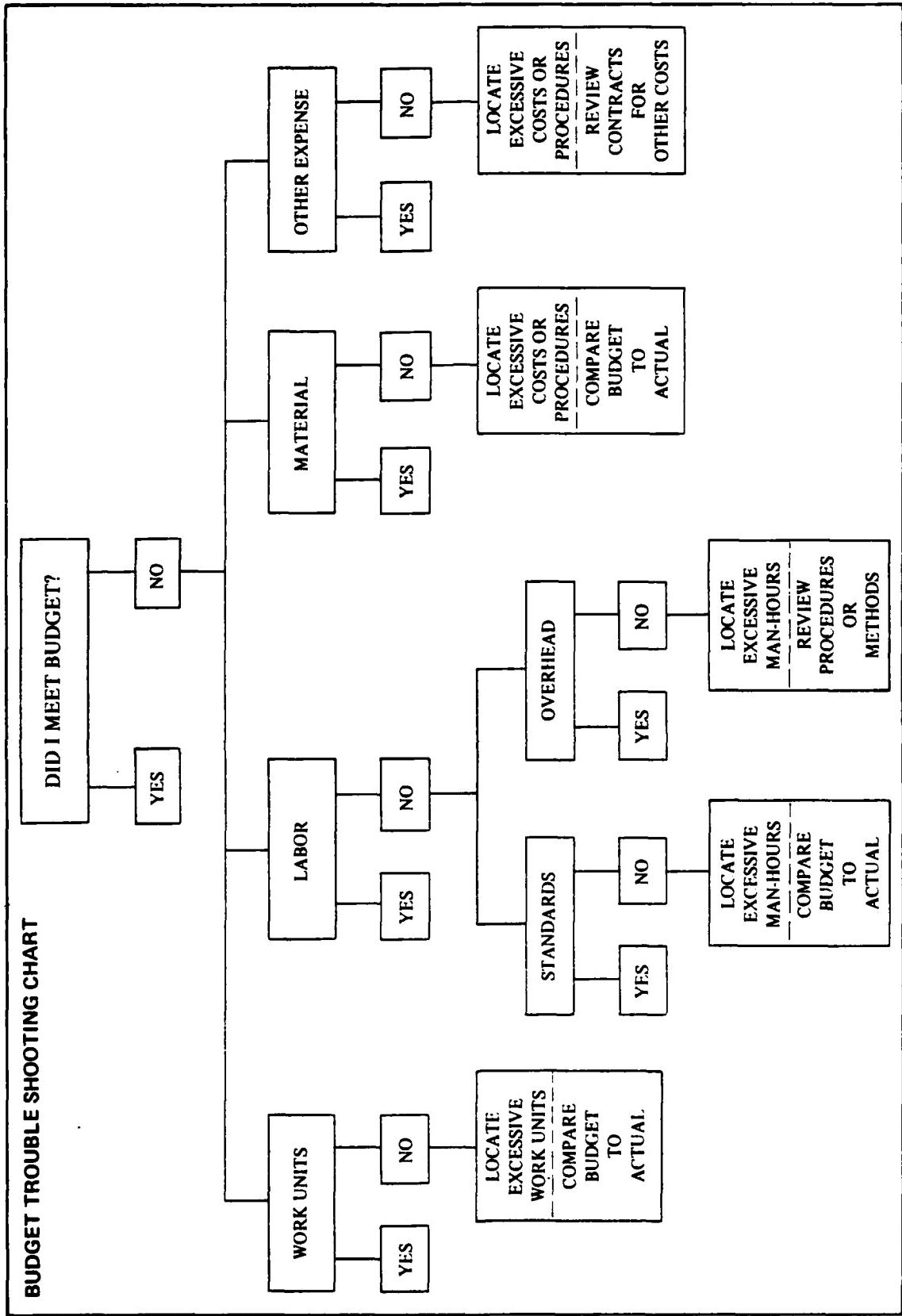


Figure 17-3
Budget Troubleshooting Chart

user is notified that the vehicle/ equipment is ready to return to service. A sample Out of Service Analysis such as that illustrated in Figure 17-4 can be used by the maintenance manager on a daily basis to review the status of equipment out of service. Corrective action should be taken when report indicates planned downtime levels are exceeded.

17-7. Maintenance Man-Hour Input. Maintenance man-hour input standards published in Appendix H are the basic elements used by management in determining O&MN funding and staffing requirements for the maintenance of CESE. It is therefore essential that the Transportation Division director, through his Maintenance Branch head and inspectors, control the amount of maintenance man-hours authorized for accomplishment on Shop Repair Orders (SRO's). An analysis in the format suggested in Figure 17-5 can be compiled on a monthly basis (by data processing or manually) which will provide the budgeted/standard maintenance man-hour versus actual expended man-hours to date. This simple analysis will alert management if the expenditure of maintenance man-hours is not being controlled within the budget plan. Activities that prepare the transportation budget in accordance with the guidelines contained in Appendix H will have the total annual budgeted/standard maintenance man-hours projected for each cost account already computed. Other activities should follow the guidelines contained in paragraph 2c of Appendix H in computing the total annual standard maintenance man-hours for each cost account. The Operating Budget/Expense Report, NAVCOMPT 2168, or similar tabulated report in the NAVCOMPT 2168 format, will provide the actual direct labor man-hours expended for each cost account. The percentage of the budgeted or standard maintenance man-hours direct labor should not exceed 8.3 percent per month.

17-8. Direct Labor Productivity. Direct labor hours expended for the month should be shown on the NAVCOMPT Form 2168. However, there are no provisions on the NAVCOMPT 2168 for showing standard (flat rate) hours. A work center productivity record showing standard flat rate hours can be maintained at the shop level. The Vehicle/Equipment Direct Labor Productivity and Downtime Record (suggested format Figure 17-6), prepared on a weekly basis, will provide the Maintenance Branch head with timely, concise information for analyzing the overall performance of each work center, highlighting areas requiring attention. The information for the report should be compiled daily. Direct labor data can be taken from the labor record maintained on each SRO and posted to the Transportation Program Evaluation Summary (Figure 17-7). This form, if used, should be originated in conjunction with and attached to the copy of the SRO maintained by the cost clerk for posting of actual hours expended on each job. The evaluation of individual mechanic performance is the job of the section supervisor. The use of either manual or computerized records for the purpose of forcing productivity, however, is discouraged as it tends to create morale and other related problems which are self-defeating to the program effort. The Maintenance Branch head should monitor the overall performance of subordinate sections with the objective of obtaining full direct productivity with the minimum of overhead.

OUT OF SERVICE ANALYSIS

		DATE _____
	NUMBER	%
I. AUTOMOTIVE (A-N)		
1. Inventory	1260	xxx
2. Out of Service (OS) Total	<u>57</u>	<u>4.5</u>
a. Out of Service, Waiting (OSW) Total	6	.5
b. Out of Service, Maintenance (OSM)	<u>19</u>	<u>1.5</u>
c. Out of Service, Parts (OSP)	<u>32</u>	<u>2.5</u>
II. OTHER VEHICLE/EQUIPMENT (O-Y)		
1. Inventory	480	xxx
2. Out of Service (OS) Total	<u>34</u>	<u>7.0</u>
a. Out of Service, Waiting (OSW) Total	5	1.0
b. Out of Service, Maintenance (OSM)	<u>10</u>	<u>2.0</u>
c. Out of Service, Parts (OSP)	<u>19</u>	<u>4.0</u>
III. ALL VEHICLES/EQUIPMENT		
1. Inventory	1740	xxx
2. Out of Service (OS) Total	<u>91</u>	<u>5.2</u>
a. Out of Service, Waiting (OSW) Total	11	.7
b. Out of Service, Maintenance (OSM)	<u>29</u>	<u>1.6</u>
c. Out of Service, Parts (OSP)	<u>51</u>	<u>2.9</u>

Figure 17-4
Sample Out of Service Analysis

MAINTENANCE MAN-HOUR INPUT AND SHOP PRODUCTIVITY ANALYSIS

Period 30 October 1979

Equip. Cost Code	Cost Account Number	Annual Budgeted Man-Hours	Applied Standard Man-Hours	Actual Man-Hours Expended to Date	Percentage of Budgeted Hours (Col 5 ÷ Col 3 x 100)	Percent of Productivity (Col 4 ÷ Col 5 x 100)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
0102	62A2	576	48	56	9.7	85.7
0103	62A3	192	14	21	10.9	66.6
0104	62A4	480	32	46	9.5	69.5
0200	62E0	576	40	37	6.4	108.1
0202	62E0	288	24	20	6.9	120.0
Sub Total	62E0	864	64	57	6.5	112.2
0311	62H0	840	70	70	8.3	100.0
0313	62G0	672	56	52	7.7	107.6
0319	62G0	336	28	34	10.1	82.3
Sub Total	62G0	1,008	84	86	8.5	97.6
0441	62J0	1,152	80	90	7.8	88.8
0580	62M0	331	20	18	5.4	111.0
Total	A-N	5,443	412	444	8.1	92.7
0325	6420	175	14	14	8.0	100.0
0880	64P0	8	.6	1	12.5	60.0
0756	64Q0	46	4	6	13.0	66.6
0887	64Q0	4	0	0	0	0
0891	64Q0	14	2	3	21.4	66.6
Sub Total	64Q0	247	20.6	24	9.7	85.8

Figure 17-5
Sample Maintenance Man-Hour Input
and Shop Productivity Analysis

VEHICLE/EQUIPMENT DIRECT LABOR PRODUCTIVITY AND DOWNTIME RECORD

USN 94-04464 ECC 0313 (SAMPLE) DATE IN 7-9-82
SRO NO. 8355 J.O. NO. 8003557 TIME IN 1000

COLUMN TOTALS (12) **13.5 13.0 11.5 13.5 22.5 47.5**

DATE OUT 7-11-82

Attach to SBO NAVFAC 11200/3A

TOTAL HRS.
DOWNTIME (13) 47.5

MILEAGE/HRS. OUT 71333

Figure 17-6
**Sample Vehicle/Equipment Direct
 Labor Productivity Downtime Record**

Instructions for Preparation of
Vehicle/Equipment Direct Labor
Productivity and Downtime Record

- A. Enter data in headings, as shown in example.
- B. Complete columns as follows.
 - (1) Work Center (WC) assigned SRO for action
 - (2) Date of WC action on SRO
 - (3) Start Time in nearest 1/10 hour SRO
 - (4) Stop time to nearest 1/10 hour SRO
 - (5) Total standard/manufacturer flat rate time to perform on SRO
 - (6) Direct labor charged on SRO
 - (7) Hours downtime, out of service waiting (OSW)
 - (8) Hours downtime, out of service maintenance (OSM)
 - (9) Hours downtime, out of service waiting parts (OSP)
 - (10) Total downtime hours, OSW, OSM, OSP
 - (11) Remarks
 - (12) Space for totals
 - (13) Total downtime. sum of columns (7), (8), and (9)

Figure 17-6
Sample Vehicle/Equipment Direct
Labor Productivity Downtime Record (continued)

COST ACCT. NO.	EQUIP. COST (CONT.)	CURRENT INVENTORY	APPROVED ALLOWANCE +/-	VARIANCE +/ -	WORK MILES/HR	TARGET MILES/ HRS	UTILIZATION %	D/TIME HRS	D/TIME %	MAN/HOUR INPUT	LABOR COST PER VEHICLE	MATERIAL COST PER VEHICLE	CONTRACT COST	TOTAL MAINT. COST PER MILF.	MAINT. ACTUAL COST MAINT. COST	ACCIDENTS	TOTAL COST (209)	NO. OF UNITS (211)	TOTAL COSTS (222)	
										ACT.	STD.	ACT.	STD.	ACT.	STD.	ACT.	STD.			
63A2 6162	4	4	0	0	28,300	29,000	98	292	15	90	70	1,000	840	698	420	0	1,778	1112	1	285
63A3 6163	5	5	0	0	31,200	32,000	97	420	40	70	77	940	924	378	462	180	1,398	1045	116	0
63B0 61651	15	16	1	0	92,500	91,000	102	6150	26	690	637	8,280	7,644	3,643	3,822	3,970	15,893	173	8	350
63B0 61653	4	4	0	0	31,300	34,000	98	3,020	16	250	380	3,000	4,560	1,600	2,380	1,790	6,398	192	67	0
63B0 TOTAL	19	20	1	1	125,800	125,000	101	11,150	28	940	1,017	11,200	12,204	5,351	6,102	5,760	22,291	177	78	20
63B0 6166	6	6	0	0	24,800	23,000	107	214	22	150	55	1,800	660	1,378	330	166	3,344	135	105	0
63B0 6167	4	4	0	0	49,700	48,000	103	270	32	270	119	3,240	1,431	1,224	715	300	4,764	695	101	0
63B0 6168	-5	5	0	0	32,100	30,900	107	8132	90	213	77	2,536	924	1,356	462	225	4,137	128	108	1
63B0 TOTAL	15	15	0	0	106,600	101,000	106	1,376	104	633	351	7,956	3,015	3,958	1,507	691	12,245	1113	105	1
63B0 6169	78	80	2	0	642,400	624,000	106	13,780	85	1,980	1,685	23,760	20,220	12,480	10,110	1,238	31,478	936	117	5
63B0 6170	10	10	0	0	50,000	51,500	97	3,400	163	200	144	2,400	1,728	1,576	864	375	4,351	987	96	0
63B0 6171	18	18	0	0	146,466	145,000	101	1,624	43	398	405	4,776	4,872	2,319	2,346	830	7,925	1054	125	0
63B0 TOTAL	106	106	2	2	858,866	820,500	105	18,804	85	2,578	2,315	30,936	26,820	16,375	13,610	2,443	49,754	658	116	5
64B0 6172	4	4	0	0	3,000	3,100	97	343	41	300	280	4,560	3,360	1,979	1,680	0	6,539	1,635	31	0
64B0 6172	2	2	0	0	2,200	2,250	98	237	57	30	56	360	672	175	336	0	535	267	25	0
64B0 6173	2	2	0	0	6,700	6,500	103	538	129	170	408	2,040	4,896	877	2,448	522	3,439	1,720	23	0
64B0 61725	2	2	0	0	7,900	8,000	101	524	126	160	254	1,920	3,048	845	1,524	350	3,115	1,750	30	0
64B0 61730	2	2	0	0	701	700	0	380	91	99	78	1,188	936	499	468	500	2,187	1,094	28	0
64B0 TOTAL	12	12	0	0	20,550	199	2,022	81	839	1,076	10,068	12,912	4,375	6,364	1,372	15,815	1,318	28	0	

Figure 17-7
Sample Transportation Program Evaluation Summary

17-9. Indirect Labor (Overhead). Indirect maintenance labor (overhead) is reported on NAVCOMPT Form 2168 under Cost Account Numbers (CAN) 6910 and 6950, and summarized under CAN 6900. CAN 6910 represents labor and material expenses incurred by personnel performing indirect duties or services relating to functions in the transportation maintenance shop. CAN 6950 represents costs incurred by allowed time, standby time, training, safety meetings, and tardiness. It is the responsibility of the Transportation Division directors to ensure that the total overhead hours under CAN 6900 do not exceed 43 percent of the direct productive standard hours for the Maintenance Branch. The formula for computing maintenance overhead is provided in paragraph 2f of Appendix H.

17-10. Material Management. The Transportation Division director, through the Maintenance Branch head and section supervisors, must exercise control over expenditures for parts and materials to ensure they do not exceed the planned budget figure. The budget for parts and materials is normally based on an average parts and materials costs per standard labor hour (Appendix H). Management should use the monthly NAVCOMPT 2168 to review parts and materials expenditures. As a customer of the Supply Department, transportation management should expect and receive a complete current updated material status report reflecting the standing of all outstanding requisitions on active/open SRO's. The Maintenance Branch head should establish a simple system for recording all outstanding requisitions and arrange with the Supply Department an agreeable followup time frame. The system developed should be structured to allow for comparison with reports provided by the Supply Department.

17-11. Maintenance Evaluation and Quality Control. The control of the quality of maintenance performed by the shop forces is exercised by the Maintenance Branch head through section supervisors. The section supervisors are responsible for checking the work of each mechanic through the various stages of repair and at completion. Work completed to the supervisor's satisfaction will be attested to by his signature on the SRO. The Transportation Division director, accompanied by the Maintenance Branch head, will make unannounced audits, at least quarterly, following the procedures set forth below:

- a. Select SRO's that have been estimated, but on which work has not been started.
- b. Inspect equipment.
- c. Review findings immediately with the original inspector (over/under maintenance) (clear descriptive entries on SRO).
- d. Review standard time authorized by checking the flat rate manuals.
- e. Take random sampling of SRO's, check for repeat work. Interim to preventive maintenance (PM) ratio should not exceed 20 percent.
- f. Take corrective action as appropriate.

Findings of the audit should be documented and retained for record purposes. Problem areas should be discussed with the section supervisors and inspectors.

17-12. Equipment History Record Requirements. The Transportation Division director is responsible to ensure that individual equipment history record files are established for each unit of CESE assigned to the activity. This record file shall be maintained in complete and up-to-date status from the time the equipment is acquired until it is transferred for disposal or excess. History record files will accompany vehicles transferred from one activity to another. As a minimum, the equipment history record file shall contain the following:

- a. Original receipt documents (DD Form 250) including contract number under which equipment was procured.
- b. Technical identification and data giving specifications regarding the basic unit and optional or special components and applicable publication document numbers.
- c. SRO's covering all inspection, maintenance, and repair items accomplished to date.
- d. Accident reports.
- e. Other appropriate documentation considered necessary for further reference purposes, such as warranty work and unsatisfactory equipment reports.

17-13. External Reporting. The NAVCOMPT Manual, Volume 3, Chapter 7, provides the system of uniform cost and statistical accounting and external reporting. This requirement is consistent with the Federal Property Management Regulation requirement for transportation operation and management (O&M) expenses and management performance data in the Transportation Cost Report (TCR) (Figure 17-8) which is a byproduct of the NAVCOMPT Form 2168. Activities with less than 50 units of transportation equipment as defined in NAVCOMPT Manual Volume 3, Chapter 7, paragraph 037100, as well as forces afloat, attaches, and missions are not required to submit the TCR. The TCR should be reviewed by the Transportation Division director prior to submission to NAVFACENGCOM to ensure consistency with data supplied by the Transportation Division.

17-14. Transportation Program Evaluation Summary. A suggested sample evaluation worksheet (Figure 17-7) is provided for use in the evaluation/analysis of the transportation program progress. From this evaluation sheet the Transportation Division manager and his subordinates can have at their disposal a comparison of:

- (1) Onhand inventory versus approved allowance
- (2) Miles traveled for the period
- (3) Percentage of utilization, actual versus target
- (4) Downtime, actual versus standard
- (5) Maintenance man-hour input, actual versus standard
- (6) Labor cost, actual versus budget

FROM (AAA OF ACTIVITY BEING REPORTED)		TO NAVATING.COM		NUMBER 1(D)1A1		C) UPDATED PLAN		REPORT		REPORTING PERIOD 30 JUN 19	
AUDITOR		AUDIT TRAILOR		APPROPRIATION DATA		CONTRACTOR		TRANSPORTATION COST REPORT		REPORTING PERIOD (Signature and date of submission)	
(ACTIVITY BEING REPORTED)		Element Management Command		MAN HOURS		MILITARY SERVICES		CIVILIAN LABOR		CUMULATIVE EXPENSES	
FUNC/ SUB FUNC/ CAT	COST ACCOUNT	Average on Hand Inventory	Production Hours	WORK UNITS	MILITARY	CIVILIAN	MILITARY SERVICES	CIVILIAN LABOR	MATERIAL AND SUPPLIES	COMMER- CIAL CON- TRACTS	OTHER
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
63A0	63A0	26	681	195	457	113	2,127	130	150	5,730	
63B0	63B0	7	724	17	117	811	265	97	1,173		
63C0	63C0	1	152	47	56	391	184	109	684		
63D0	63D0	5	315	26	95	654	294	12	960		
63E0	63E0				725	4,979	3,070	348	150	8,547	
63A0	63A0	16,273								8,467	
63B0	63B0	616							320	320	
63C0	63C0	4,710							1,925	1,925	
63D0	63D0	4,507							1,875	1,875	
63E0	63E0								12,587	12,587	
6420	100	2,463	100		1,958	13,759	6,259	292	20,310		
6460	32	438	14,647		3,120	15,870	12,400	1,320	29,590		
6450					2,324	17,349	13,582	1,541	32,772		
6400					7,402	46,978	32,241	3,153	82,172		
6420									1,000	1,000	
6460									4,725	4,725	
6450									3,800	3,800	
6400									9,525	9,525	
6510									1,800	1,800	
6540									1,800	1,800	
6710					31,828	98,400				98,400	
6740					42,730	135,100				135,100	
6700					74,558	231,700				231,700	
6810					1,800	9,400	800			10,200	
6800					1,800	9,400	800			10,200	
6910					3,440	17,28	15,600	2,000		24,500	
6900					3,440	86,413	15,600	301,957	60,223	5,301	383,231
TOTAL	173	4,777							130		

Figure 17-8
Sample Transportation Cost Report

- (7) Material expenditures, actual versus budget
- (8) Contract costs
- (9) Total actual maintenance cost
- (10) Maintenance cost per mile
- (11) Fuel usage data
- (12) Accidents and costs
- (13) Ratio indirect to direct labor
- (14) Shop labor rate

These data can assist in isolating areas causing digression from the management plan and enable corrective action before major financial problems develop. Procedure for preparing the analysis worksheet is as follows.

- a. Column (1). Enter applicable Cost Account Number.
- b. Column (2). Enter applicable equipment codes.
- c. Column (3). Enter current inventory from organization records.
- d. Column (4). Enter latest approved allowance.
- e. Column (5). Enter variance, over/under allowance.
- f. Column (6). Enter work units (miles, hours, units) from organization records.
- g. Column (7). Enter target miles/hours from latest EFD validation.
- h. Column (8). Enter utilization percentage, Column (6) divided by Column (7) multiplied by 100 equals percentage.
- i. Column (9). Downtime hours, post from organization records.
- j. Column (10). Downtime percentage, column (9) divided by (Column (3) multiplied by 2,080) then multiplied by 100 equals percentage.
- k. Column (11). Man-hour input actual, from NAVCOMPT 2168 Column (6).
- l. Column (12). Man-hour input standard, from budget submission or compute from Appendix H.
- m. Column (13). Labor cost actual, from NAVCOMPT 2168 Column (8).
- n. Column (14). Labor cost budgeted from budget submission.
- o. Column (15). Material cost actual, from NAVCOMPT 2168 Column (9).

- p. Column (16). Material cost budgeted from budget submission.
- q. Column (17). Contract cost, from NAVCOMPT 2168 Column (10).
- r. Column (18). Total actual maintenance cost, from NAVCOMPT 2168 Column (12).
- s. Column (19). Maintenance cost per mile, Column (18) divided by Column (6).
- t. Column (20). Fuel, mi/gal or gal/hr from NAVCOMPT 2168 Column (4), 6200 Series CAN's divided by 6300 Series CAN's equal mi/gal. For the same equipment code from NAVCOMPT 2168 Column (4) 6400 Series CAN's divided by 6500 CAN's for the same equipment code equals gal/hr and gal/unit.
- u. Column (21). Enter number of accidents from organization records.
- v. Column (22). Enter accident cost from NAVCOMPT 2168 Column (12) CAN 6290. Column (22) divided by Column (21) equals accident cost per unit (target \$25.00).

Block #1 Shop Labor Rate (SLR) from NAVCOMPT 2168 Column (8) divided by Column (6) equals SLR.

Block #2 Ratio, Indirect to Direct Maintenance Labor from NAVCOMPT 2168 Column (8) CAN 6900 divided by sum of CAN's 6200 and 6400.

CHAPTER 18. PREVENTIVE MAINTENANCE SCHEDULING AND SHOP CONTROL PROCEDURES

18-1. Maintenance Scheduling and Shop Control. An effective and efficient maintenance program requires the establishment and upkeep of a preventive maintenance scheduling system and a sound shop control procedure. Vehicles and equipment shall be scheduled for inspection and servicing in accordance with the time, mileage, and operating hours prescribed in Chapter 19, Section 4. As a minimum, the schedule shall ensure that each vehicle is inspected for safety in accordance with paragraph 19-4a at least every 12 months or 12,000 miles, whichever occurs first. The schedule can be formulated by determining each vehicle's estimated annual miles and dividing by the manufacturer's recommended service interval. This will determine the number of service intervals per year for each vehicle. Dividing the number of working days per year (252) by the number of service intervals per year will develop the number of working days between each inspection or the designated inspection group for each vehicle. From this determination a schedule can be established providing a quota of vehicles for inspection daily that will provide a balanced shop workload. A Vehicle/Construction Equipment Service Record form similar to that shown in Figure 18-1, should be used to record service intervals and service performed.

18-2. Maintenance Control Procedures. Adequate control demands positive direction of shop workloads. This can only be accomplished through availability of current information at all times regarding:

- (1) Direct labor available in shop by work center
- (2) Backlog man-hours by work centers
- (3) Man-hours assigned to the shop

There are a number of methods that may be used for workload control. One method is to use a transportation maintenance shop workload control board (see Figure 18-2). Such a control board can be used by the production control dispatcher to display the workload status of the shop/work centers. The indicator on each line can be moved across the scale to show the current standard hours workload. For example, a single work center could have 175 hours of inspected backlog work yet to be scheduled into the shop, 100 hours of work in progress, and 150 hours of work deadlined for parts. The board also can be used to show the available man-hours by shop or work center.

18-3. Maintenance Dispatching Procedures. The flow chart of shop repair orders (Figure 18-3) illustrates recommended dispatching procedures, the flow of SRO's, and the lines of communication between the production control dispatcher, inspection/estimating work centers, and the cost control clerk. See paragraph 18-5.c. for details on preparing a SRO.

18-4. Supply Support.

a. Purpose. For a maintenance organization to perform effectively, it is essential that it receive responsive repair parts support. Such support requires a high degree of cooperation and communication between the management and staff of the shop and the shop store, and between the Public Works Officer

and the Supply Officer. The responsibilities involved must be understood and fulfilled. NAVFACENGGCOM and NAVSUPCOM have recognized these understandings and promulgated them as policy in joint NAVFAC/NAVSUP Instruction 11200.28. The essential portions of this Instruction are outlined in the following paragraphs.

b. Public Works Responsibility to Supply Department.

(1) The Public Works Department shall ensure that all initial support repair parts received in Public Works are turned over to the Supply Department for inventory control and accountability. Initial support repair parts intended for activity stock shall not be retained in the Public Works Department spaces without the prior knowledge and consent of the Supply Officer. By mutual agreement between the Public Works Officer and the Supply Officer, and when local conditions warrant, designated initial repair parts may be retained in the physical custody of the Public Works Officer, but shall remain on the records of the Supply Department until issued to end user for inventory control and accountability purposes.

Figure 18-1

TRANSPORTATION MAINTENANCE SHOP WORKLOAD CONTROL

WORK CENTER		STANDARD MAN-HOURS							
66 INSPECTIONS- HRS BACKLOG	0	25	50	75	100	125	150	175	200
66 INSPECTIONS- HRS SCHEDULED INTO SHOP	0	25	50	75	100	125	150	175	200
66 GENERAL REPAIR- HRS INSPECTED BACKLOG	0	25	50	75	100	125	150	175	200
66 GENERAL REPAIR- HRS SCHEDULED INTO SHOP	0	25	50	75	100	125	150	175	200
66 GENERAL REPAIR- HRS UNADJUSTED WORK	0	25	50	75	100	125	150	175	200
70 BODY-FENDER- HRS INSPECTED BACKLOG	0	25	50	75	100	125	150	175	200
70 BODY-FENDER- HRS SCHEDULED INTO SHOP	0	25	50	75	100	125	150	175	200
70 BODY-FENDER- HRS UNADJUSTED WORK	0	25	50	75	100	125	150	175	200

Figure 18-2
Transportation Maintenance
Shop Workload Control Board

(2) Provide information regarding repair parts requirements needed to support vehicles/equipment on hand or for any new vehicle/equipment receipts. (Requirements would normally be generated from actual operational experience or through normal routine inspection of equipment.)

(3) Furnish advance information regarding repair parts requirements for scheduled overhauls. (Requirements would be generated in the same manner outlined in paragraph 18-4.b.(2).)

(4) Provide technical assistance to the transportation shop store in parts identification, in screening onhand stocks to identify obsolete items, in identifying insurance items, and in determining parts interchangeability.

(5) Advise the transportation shop store of equipments scheduled for disposal or phaseout and assist in identifying stocked items which should be eliminated from the shop store because of those plans.

(6) In the absence of available resources in the Navy Stock Fund, provide end use O&MN funds to permit procurement and delivery of repair parts required for work in progress, or for subsequent scheduled services and repair for which job orders have been issued.

(7) Conduct periodic followup shop store parts orders (after required delivery date has passed) to ensure that appropriate action has been taken to reduce further delay.

(8) Encourage active coordination/communications between Public Works and Supply Department personnel.

c. Supply Department Responsibility to Public Works (Transportation).

(1) Provide timely repair parts support through use of onhand stocks, system stocks, or purchase action using imprest fund and blanket purchase authority.

(2) Perform technical research for parts identification and to determine part numbers, interchangeability, and cross-referenced parts numbers.

(3) Collaborate with Public Works in establishing stock levels in support of current and projected vehicle/equipment populations.

(4) Record parts usage data for subsequent stock range and depth adjustments.

(5) Expedite local procurement action for immediate issue requirements when parts required are not available in shop store or main inventory.

(6) Review outstanding requisitions regularly to ensure that status received indicates satisfactory supply action is in progress. Followup as necessary to obtain delivery status.

(7) Advise Public Works personnel promptly on receipt of status indicating delayed delivery of requested repair parts.

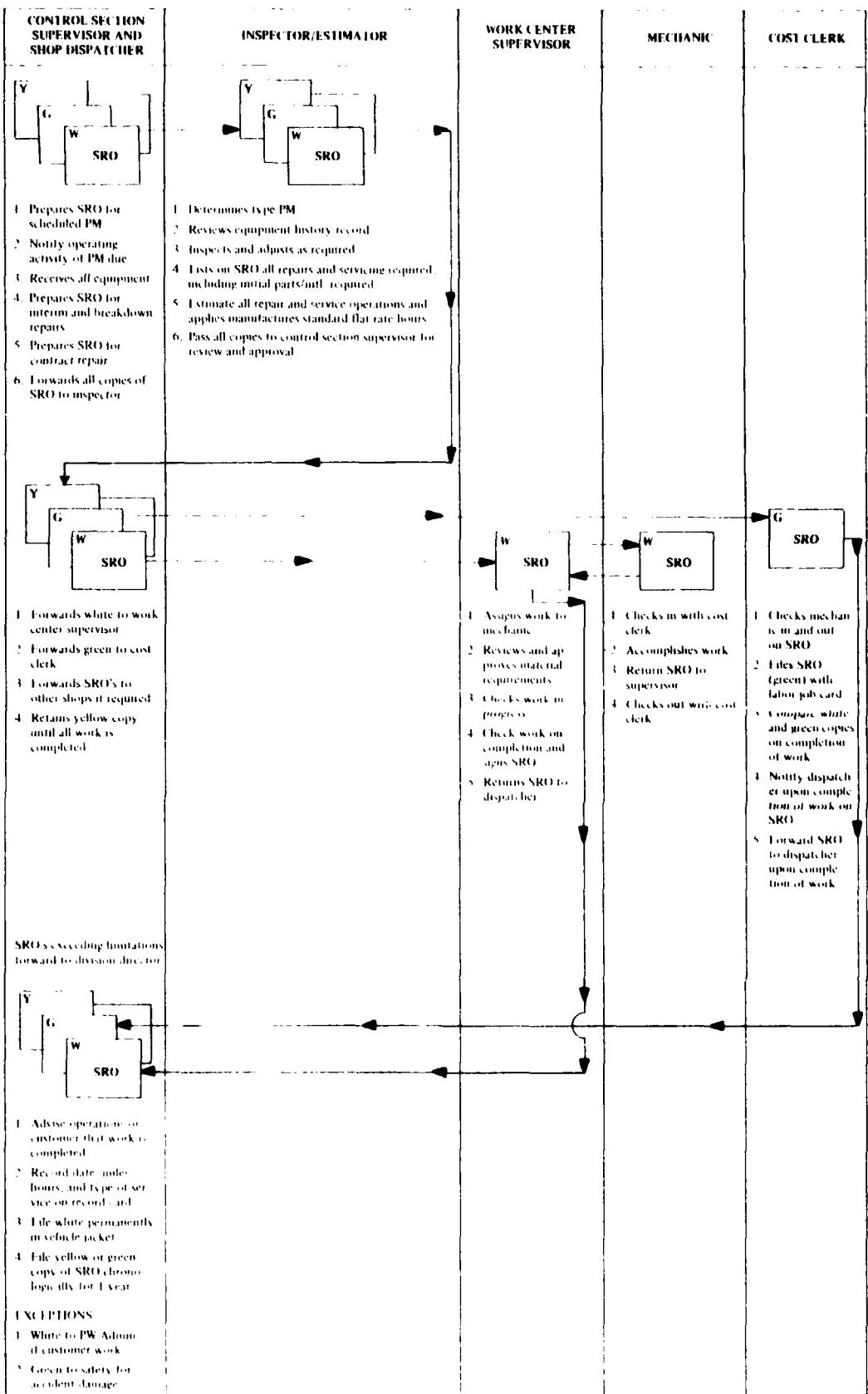


Figure 18-3
Flow Chart for Shop Repair Orders

(8) Assume responsibility for staging of material by segregating material receipts applicable to specific repair jobs and advising the shop maintenance supervisor of material status.

(9) Encourage active coordination/communications between Supply Department and Public Works personnel.

d. Technical Parts Ordering Data. Surveys conducted by NAVFACENGCOM into the breakdown in repair parts support has revealed that much delay and downtime are caused by the mechanic's failure to provide adequate technical data when requesting parts. It shall be standard practice in all maintenance shops to provide shop stores with the following information for all but common hardware and bulk material.

(1) Description of Major Unit. Describe the vehicle or equipment unit for which part is applicable, such as Truck, 1/2 ton, 4 x 2, 5,000#GVW.

(2) Manufacture of Major Unit. Give the make.

(3) Model of Major Unit. Give manufacturer's model designation.

(4) Year of Manufacture or Model Year. Determine from nameplate.

(5) Serial No. of Major Unit. Determine from nameplate.

(6) Description of Component. Describe major component for which the part is required. For example, Engine V8 260 cubic inches, Transmission, 5 speed. Component identification can be determined from manufacturer's component line set lists provided with all new equipment. (Manufacturer's line set lists should be filed in the equipment history record jacket.)

(7) Manufacturer of Component. Give make of major component when other than make of major unit.

(8) Serial Number of Component. Give serial number from component nameplate where applicable.

(9) Description of Part. Give full description of part using standard nomenclature with noun name first followed by descriptive modifiers such as SPROCKET, CAMSHAFT; KIT, CARBURETOR. Provide the part name when available; however, the correct part name is the responsibility of the parts man and should be verified. Parts numbers should be recorded on the SRO for future reference. This practice saves research time for the parts man.

18-5. Procedures for the Preparation of Maintenance Forms.

a. Operator's Inspection Guide and Trouble Report, NAVFAC 9-11240/13. The Operator's Inspection Guide and Trouble Report is used by operators of motor vehicles to indicate the items that they are required to inspect before and after operation. It also serves as a means of transmitting information regarding deficiencies detected during inspection or operation. The following procedures are prescribed for field application of this form. (See Figure 18-4.)

(1) The operations dispatcher issues form to operator at the time of vehicle assignment.

(2) Operator inspects each item listed on the form, before and after operation.

(3) Operator indicates by a check mark any item that does not function properly. The "Remarks" space may be used for items not listed or for additional information concerning deficiencies indicated by a check mark.

(4) Operator turns in form to the operations dispatcher at the end of each day.

(5) The operations dispatcher forwards forms that indicate deficiencies to the maintenance dispatcher for appropriate action. Other forms may be destroyed.

OPERATOR'S INSPECTION GUIDE AND TROUBLE REPORT	
REGISTRATION NO. 94-16008	ODOMETER READING 23660
Use this form as a guide when performing before and after operation inspections. Check (✓) items that require servicing by maintenance personnel.	
<input type="checkbox"/> 1. DAMAGE (Exterior/Interior/Missing Components)	
<input type="checkbox"/> 2. LEAKS (Oil, Gas, Water)	
<input type="checkbox"/> 3. TIRES (Check inflation, abnormal wear)	
<input type="checkbox"/> 4. FUEL, OIL, WATER SUPPLY (Antifreeze in season)	
<input type="checkbox"/> 5. BATTERY (Check water level, cables, etc.)	
<input checked="" type="checkbox"/> 6. HORN	
<input type="checkbox"/> 7. LIGHTS/REFLECTORS/MIRRORS/TURN SIGNALS	
<input type="checkbox"/> 8. INSTRUMENTS (Oil, Air, Temperature, etc.)	
<input checked="" type="checkbox"/> 9. WINDSHIELD WIPER	
<input type="checkbox"/> 10. CLEAN WINDSHIELD/VEHICLE INTERIOR	
<input type="checkbox"/> 11. CARGO, MOUNTED EQUIPMENT	
<input type="checkbox"/> 12. STEERING	
<input type="checkbox"/> 13. SAFETY DEVICES (Seat belts, flares, etc.)	
<input type="checkbox"/> 14. DRIVE BELTS/PULLEYS	
<input type="checkbox"/> 15. BRAKES (Drain air tank when equipped)	
<input checked="" type="checkbox"/> 16. OTHER (Specify in "Remarks")	
DATE 1/16/70	OPERATOR'S SIGNATURE <i>Joe O'Connor</i>
REMARKS Horn won't blow Wiper blade missing SF94-Accident Report Form not in vehicle	

DAV/PAC 9-1120G/12 (12-69)
Replaces DD Form 1350

6-16008

Figure 18-4
Operator's Inspection Guide and Trouble Report

(6) The maintenance dispatcher refers NAVFAC 9-11240/13 to the inspector who determines if the deficiencies noted on the form require immediate attention, or if correction may be safely deferred until the next scheduled inspection. If immediate attention is required, the maintenance dispatcher advises the operations dispatcher. If the correction is deferred, the form is attached to the Service Record Card so that the deficiency may be described on the Shop Repair Order (NAVFAC 9-11200/3A) at the time the SRO is prepared for the next scheduled inspection.

b. Shop Repair Order. NAVFAC Form 11200/3A, Shop Repair Order, is a three-part set (see Figure 18-5). Each Shop Repair Order (SRO) set consists of an original white, green, and yellow copy. Space is provided for indicating description and identification of equipment, statistical and cost coding, standard and actual hours, and scheduling and dispatching information. The SRO is used to:

- (1) Specifically authorize and control repair work on all types of CESE including authorization to requisition necessary repair parts from shop stores;
- (2) Furnish basic information for management analysis;
- (3) Authorize work on equipment when work is performed in a shop other than the transportation shop in the activity;
- (4) Authorize a specific job under a Work Request (NAVCOMPT Form 140) issued by the ordering activity;
- (5) Support the Order for Supplies or Services (DD Form 1155) as source material for the preparation of reports at small activities wholly serviced by a commercial facility.

c. Shop Repair Order Preparation. An SRO will be prepared each time labor or materials are expended for the maintenance, repair, modernization, alteration, or improvement of an item of equipment except for minor work that does not exceed 18 minutes (0.3 hours). The SRO shall clearly and specifically describe the work to be performed in terminology generally used in commercial flat rate manuals. Mechanical personnel are not authorized to perform work that is not specified on the SRO. The SRO will be considered complete at the time the control section releases the equipment to the using organization's representative. In cases where items on the SRO must be deferred because of a lack of parts and it is determined that the equipment can be safely returned to service, the remaining repair operations shall be entered on a new SRO and accomplished as scheduled work at a later date. Under no circumstances shall the original SRO be held open pending completion of repairs once the vehicle is released for use. White copy of SRO shall be completed showing all labor and material expended and totaled in the lower right-hand block.

d. Preliminary Entries. A designated person in the control section shall complete the heading entries, blocks (1) through (14) of the SRO for each piece of equipment prior to the inspection due date shown on the preventive maintenance schedule.

Figure 18-5
Shop Repair Order: NAVFAC 9-11200/3A

SHOP REPAIR ORDER

(2) Job Order No

ପ୍ରକାଶନ କମିଶନ

ପ୍ରକାଶନ

Figure 18-5 (continued)
Shop Repair Order, NAVFAC 9-11200/3A

e. Inspection and Work Control. Upon receipt of the SRO and related equipment, the inspector shall enter mileage or hours of operation, inspect the equipment, and make minor adjustments. As repair requirements are diagnosed by the inspector, each repair operation shall be entered on the SRO and standard manufacturer's job operation time standards (flat rate hours) applied to each separate repair operation to be accomplished. The SRO shall then be passed to the supervisor of the control section for review, approval, and release for accomplishment. The SRO is then passed to the control section shop dispatcher who issues the white copy to the appropriate repair section supervisor for work accomplishment. The green copy is routed to the cost clerk. The shop dispatcher retains yellow copy for tracking control and expediting until work is completed. The repair section supervisor assigns work to mechanic, reviews and approves parts/material requirements, checks work in progress, checks work upon completion and signs block 37 on the SRO indicating the work has been satisfactorily completed, and returns SRO to the control section shop dispatcher.

f. Work Accomplishment. The mechanic, upon receipt of the assigned SRO from his supervisor, checks in with the cost clerk, proceeds with the work, initials the completed repair operations specified on the SRO, and returns the SRO to his repair branch supervisor and checks out with the cost clerk when work is completed or work is delayed for any reason. The white copy on delayed work shall be returned by the supervisor to the shop dispatcher. The cost clerk records the mechanic's start time on the labor job card and clips the card to the green copy of the SRO and files in active repair work file. When the work is stopped for any reason, the cost clerk pulls the green copy of the SRO and the labor job card and records the stop time. Delayed SRO's shall be held in the cost clerk's pending suspense file until again activated. When work is completed, the cost clerk shall compare the white original and the green copy of the SRO record actual time, compute downtime, and forward the completed SRO to the shop dispatcher. The shop dispatcher shall advise the Operations Branch or customer that vehicle is ready for pickup. The date, miles/hours, and type of service is then to be posted on the service record (Figure 18-1). File the white original of the SRO in the vehicle history jacket for the life of the vehicle. The yellow or green copy is to be filed chronologically for 1 year. The white copy shall be forwarded to Public Works Administrative Section if the work is for a customer. The green copy is to be forwarded to the station safety office if the work is the result of accident damage.

g. Work on Equipment Owned by Other Activities. Upon completion of shop work on equipment owned by another activity, disposition of the SRO shall be as follows.

(1) Original shall be priced and forwarded to the Comptroller Department or Fiscal Office of the performing activity for attachment to a bill or report and subsequent transmission to the ordering activity.

(2) Green copy shall be forwarded with the vehicle for filing in the equipment history jacket.

(3) Yellow copy shall be retained for the performing shop's records, or destroyed, as desired.

h. Work Performed by Other Shops Within the Activity. When work on equipment is to be performed by another shop within the activity, a SRO identifying the equipment and work to be performed, together with the appropriate transportation job order number, shall be prepared. The Control Section supervisor shall distribute the SRO as follows.

(1) Original to the other shop, via the shop dispatcher, for work listed on the SRO to be performed by that shop; the other shop shall perform designated repair operations, record elapsed time, price labor and material issues, and return the original with the equipment.

(2) Green copy shall be retained by the shop dispatcher when all work is performed by the other shop, or forwarded to the cost clerk when work will be performed by both the transportation shop and other shop(s).

(3) Yellow copy shall be retained by the shop dispatcher until the original is returned, and then filed chronologically for 1 year.

i. Work Performed by Commercial Contractors. An order for supplies or services (DD Form 1155, supported by a SRO) is used when equipment maintenance work or service is performed by a contractor, or when occasional work is ordered from a commercial facility. The Control Section supervisor shall ensure that the SRO covering equipment scheduled for contract work is properly documented with the necessary preliminary data and turned over to the inspector. The inspector shall list on the SRO the necessary repair operations and apply manufacturer's flat rate standards to each operation listed; then return the SRO to the Control Section supervisor. The Control Section supervisor shall enter the final data: contract labor rate and amount; contract number; order number; and necessary accounting data. The Control Section supervisor shall then forward the SRO to the Contracting Officer. The Contracting Officer shall prepare an original and six copies of DD Form 1155; one copy shall be forwarded to the Comptroller or Fiscal Officer, where the estimated amount shall be entered on allotment records as an obligation. The original and four copies, together with both copies of the SRO, shall be returned to the shop dispatcher for delivery with the equipment to the contractor. The person delivering the equipment to the contractor shall obtain a custody receipt and return it to the shop dispatcher. Upon completion of repairs, the contractor shall return the equipment to the shop dispatcher with the original and one copy of the SRO, four copies of DD Form 1155, and the original and three copies of the contractor's bill. The shop dispatcher shall destroy the custody receipt and turn the equipment over to the inspector. Upon completion of the inspection and approval of the work performed by the contractor, the inspector shall review the work and the bill with the Control Section supervisor. If all is correct, the Control Section supervisor shall certify the bill for payment. The original of the SRO, three copies of the DD Form 1155, and three copies of the contractor's bill shall then be forwarded to the appropriate office for final processing and payment. The green copy of the SRO, one copy of the DD Form 1155, and one copy of the contractor's bill shall be filed in the vehicle history jacket for the life of the vehicle.

j. Work Performed by Other Government Agencies. Procedures for the performance of work or services by other Government departments or agencies, military or nonmilitary, are basically the same as for work performed by a commercial contractor. An appropriate order for work or services (Project

Order, NAVCOMPT Form 2053 for other military departments; Order for Supplies or Services, DD Form 1155 or NAVCOMPT Form 2053 for nonmilitary departments) is prepared from data cited on a SRO supporting the order. Procedures for preparing the necessary documents are contained in the NAVCOMPT Manual, Volume 3, Chapter 5, paragraph 035411. After completion of the work or services, the other Government department shall indicate the actual hours worked and the actual material cost on the SRO. The original and green copies of the SRO shall be returned to the requesting activity with a Voucher for Transfer Between Appropriations and/or Funds, Standard Form 1080. After inspection, approval, and certification of the work, the original of the SRO and attached documents shall be forwarded to the Comptroller or Fiscal Officer for payment. The green copy of the SRO shall be filed in the vehicle history jacket for the life of the vehicle.

18-6. Maintenance Inspection/Service Record. The Maintenance Inspection/Service Record, NAVFAC 11200/46 (Figure 18-6) is an adhesive-type sticker which is placed on the windshield, dash, or other conspicuous section of the equipment after each scheduled PM service. The purpose of the form is to remind the operator of the date the equipment is scheduled for the next PM service. It also provides information on the dates of the last oil and filter change and lubrication. In addition, a sticker similar to that shown in Figure 18-7, indicating the month the vehicle is due for the next safety inspection, shall be used. The safety sticker shall be affixed by the inspector to the lower center portion of the windshield after the vehicle has passed inspection. Vehicles operating with an expired safety inspection sticker shall not be serviced or fueled at the service station; the driver shall be directed to return the vehicle to the motor pool for further instructions.

18-7. Operator's Daily PM Report, Construction and Allied Equipment. The Operator's Daily PM Report, Construction and Allied Equipment, NAVFAC 11260/4 (Figure 18-8) is used by operators of construction and allied equipment (except weight handling equipment) as a guide when performing daily PM services, and reporting equipment deficiencies, hours operated, and fuel issued. (See Chapter 21, paragraph 21-2, for operator's daily check of weight handling equipment.) The following procedures are prescribed for field application of NAVFAC 11260/4.

- a. Operations dispatcher issues form to the operator when the equipment is assigned.
- b. Equipment operator performs preservice maintenance checks and indicates findings on the form.
- c. Equipment operator records malfunctions of other items requiring attention as observed during the working day.
- d. Equipment operator records the number of gallons of fuel issued to the equipment while in his custody and enters hours operated at the end of the day. Hour readings shall be taken from the equipment hour-meter. Actual operating hours shall be estimated for those units not equipped with hour-meters.

e. At the close of business each day, the form is turned in to the operations dispatcher, who reviews the form to ensure that the entries are valid and to take note of any deficiencies reported. The form is then forwarded to the maintenance dispatcher for further processing.

MAINTENANCE INSPECTION/SERVICE RECORD

NEXT MAINTENANCE DUE MILES/HOURS		DATE
<i>Note - When NO service is performed, POST DATA from PRIOR STICKER</i>		
SERVICES PERFORMED	* MILES/HOURS	* DATE
<input type="checkbox"/> OIL CHANGE		
<input type="checkbox"/> FILTER CHANGE		
<input type="checkbox"/> LUBRICATE CHASSIS		
<input type="checkbox"/> SERVICE AIR CLEANER		
<input type="checkbox"/> ENGINE TUNE-UP		
<input type="checkbox"/> SMOG CONTROL DEVICE		
<input type="checkbox"/> SAFETY INSPECTION		
LAST PM (circle type)	A B C	NAVFAC 11200/46 (B-70) Supersedes NavDocks 9-11200/3

Figure 18-6
Maintenance Inspection/Service Record,
NAVFAC 11200/46

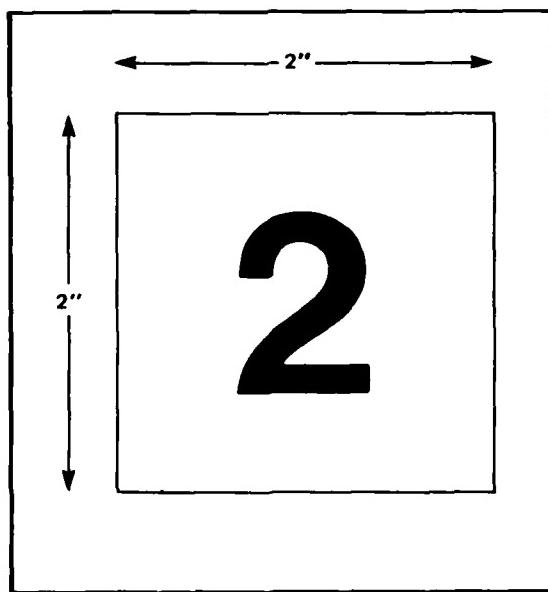


Figure 18-7
Sample Vehicle Safety
Inspection Sticker

**OPERATOR'S DAILY PM REPORT
CONSTRUCTION & ALLIED EQUIPMENT
NAVFAC 11260/4**

Use Reverse Side for Remarks
Explanatory Notes on Reverse Side.

USN NO.

44-05178

FUEL

12

OPR HRS

3

OPERATOR'S DAILY SERVICES

- 1 Fill radiator to proper level. Remove debris from core.
- 2 Inspect belts for proper tension, alinement and condition.
- 3 Fill to proper level, inspect for leaks.
- 4 Inspect and clean oil bath and dry type as required.
- 5 Clean filter jar as often as conditions warrant.
- 6 Visually inspect for conditions. Fill to proper level.
- 7 Fill to proper oil levels and inspect for leaks.
- 8 Perform daily lubrication services as designated by the Transportation Division.
- 9 Check tire pressure with gage. Inflate as necessary to recommended pressure. Remove glass, stones, nails, etc.
- 10 Inspect for condition, safety guards, boom stops, radius indicators, warning devices, ladders, fire extinguishers, etc.
- 11 Inspect unit for general condition. Correct or report any deficiencies requiring mechanics attention.
- 12 Fill fuel tank as necessary.
- 13 Check all gages and meters for proper operation.
- 14 Perform prescribed shutdown services such as securing machines, draining air tanks, cover exhaust stacks, close hoods, etc.
- 15 List any deficiencies noted during operation.

REMARKS:

NO.	ITEM	OK ✓	SERVICES PERFORMED
1	RADIATOR SOLUTION		
2	GEN. & FAN BELT		ADJUSTED
3	ENGINE OIL LEVEL		
4	AIR CLEANER		
5	PRECLEANER		
6	BATTERY		ADDED WATER
7	HYD. OIL LEVEL		
8	LUBRICATION		
9	TIRE CONDITION		
10	SAFETY EQUIP.		
11	GENERAL COND.		
12	FUEL LEVEL		ADDED 12 GAL
13	INSTRUMENTS		
14	SHUTDOWN PRECAUTIONS		
15	OTHER		
DATE		OPERATOR'S SIGNATURE	
<u>1/14/62</u>		<u>R.R. Ryan</u>	

Figure 18-8
Operator's Daily PM Report, Construction and
Allied Equipment, NAVFAC Form 11260/4

CHAPTER 19. PREVENTIVE MAINTENANCE PROCEDURES FOR AUTOMOTIVE VEHICLES

19-1. Purpose of Preventive Maintenance. An important element of the Transportation Maintenance Management Program is the periodic performance of scheduled preventive maintenance (PM) inspections, lubrication services, and adjustments. The purpose of PM is to keep equipment in safe and reliable condition, with maximum equipment availability and minimum cost of maintenance and capital equipment.

19-2. Operator Preventive Maintenance. Operators are the first line of defense against equipment wear, failure, and damage. Equipment must be inspected by the operator daily before, during, and after operation so that defects or malfunctions can be detected before they result in serious damage, failure, or accident. Defects detected during these inspections, or during operation of the equipment, shall be noted on the Operator's Inspection Guide and Trouble Report, NAVFAC 9-11240/13 (Figure 18-4), and reported as soon as operation has ceased. The operator must stop operation immediately when a deficiency develops that renders the equipment unsafe, or could damage the equipment.

19-3. Service Station Servicing. The following services shall be performed by the operator, shop storeman, or maintenance personnel during each refueling:

- (1) Check oil level in crankcase and fluid levels in transmission and power steering pump
- (2) Check tires for proper inflation and condition
- (3) Check electrolyte level in battery
- (4) Check coolant level and antifreeze

NOTE: When the preceding functions are performed by other than the operator, it is still the operator's responsibility to supervise the others' performance and to ensure that the required services have been accomplished and the equipment appears to be in safe operating condition. If the vehicle is not displaying a currently valid inspection sticker (see paragraph 18-6) it must not be operated unless approved by the Operations Supervisor.

19-4. Scheduled Preventive Maintenance for Automotive Vehicles. Automotive vehicles shall be inspected periodically by qualified automotive inspection personnel for safety and reliability as follows.

a. Safety Inspection. Each motor vehicle shall be inspected for safety at intervals not to exceed 12 months or 12,000 miles, whichever occurs first. To avoid unnecessary downtime, the safety inspection shall be performed at the time of the scheduled reliability inspection in accordance with the manufacturer's recommendations. The safety inspection shall include all the items set forth in paragraph 19-5 following, and the correction of any deficiencies uncovered by the inspection before returning the vehicle to an operational status.

b. Reliability Inspection. In addition to the safety inspection prescribed, vehicles shall be inspected and serviced in accordance with the manufacturer's prescribed services and service intervals, such as miles or time as set forth in the manufacturer's shop manual and lubrication chart furnished with the vehicle. Corrective adjustments and repair actions taken as the result of serviceability inspections shall generally be limited to only those items prescribed by the manufacturer and only to the extent necessary to restore the vehicle to a degree of serviceability consistent with achieving the highest degree of cost effectiveness. Repairs shall be authorized by the inspector only after thorough diagnosis and detection of malfunction, wear, or deterioration. Where the manufacturer specifies optional adjustments, such as "engine tuneup," such adjustments shall be made. As a minimum, tuneups shall be performed annually, or at 12,000 miles, whichever occurs first. Adverse local conditions may require more frequent routine maintenance inspections of a preventive nature to reduce road failure service calls. In such cases, the requirement shall be determined by management and the action shall be a policy matter directed by management in writing.

c. Development of Specifications for Scheduled Inspections and Services. Each activity shall develop an inspection specification and schedule in accordance with the sample format shown in Figure 19-1, if such charts are not provided in vehicle maintenance manuals. The inspection, lubrication, and adjustment actions and frequencies shall be determined from those recommended in the manufacturer's maintenance manual provided with the vehicle. A separate specification and schedule shall be developed for each make and model where different. These specifications and schedules shall be developed under the direction of the Transportation Director and shall be approved in writing by him.

d. Unscheduled Maintenance Service. Unscheduled maintenance service is the correction of the deficiencies reported by the vehicle operator that occur between scheduled safety or other inspections and services as prescribed by the manufacturer. Unscheduled maintenance services will generally be limited to the correction of only those specific items reported as being deficient by the operator and confirmed by qualified inspection personnel. Other unreported deficiencies observed by the inspector at the time of an unscheduled service that affect safety, or could cause damage to the equipment, shall be corrected prior to releasing the vehicle for service.

19-5. Automotive Vehicle Safety Inspection Checklist. The following inspection shall be performed each 12 months or 12,000 miles, whichever occurs first, or simultaneously with the manufacturer's recommended service interval and services.

a. Brakes.

(1) Test to determine if brakes are functioning properly.

(2) Check brake pedal free travel as required.

(3) Remove right front wheel; inspect brake drum or rotor; inspect for wear or cracking; inspect linings or pads for excessive wear; check wheel cylinders for leaks and evidence of deterioration.

SPECIFICATION FOR SCHEDULED MAINTENANCE INSPECTIONS AND SERVICES

VEHICLE MAKE	MODEL(S)	YEAR(S)		
OPERATION	SERVICE INTERVAL	See Manual Page		
1000 MILES →	6 12 18 24 30 36 42 48			
ENGINE				
Change engine oil and filter	X X X X X X X X X	03-12		
Clean and refill oil bath air cleaner (if so equipped)	X X X X X X X X X	03-03		
Replace dry-type air cleaner filter (6 cyl.)	X X X X X X X X X	03-03		
Replace dry-type air cleaner filter (8 cyl.)	X X X X X X X X X	03-03		
Test crankcase emission system. Clean system and replace emission control valve if required.	X X X X X X X X X	04-11		
Clean crankcase emission system hoses, tubes, fittings, carburetor spacer and replace if necessary. Replace emission control valve.	X X X X X X X X X	04-11		
Clean crankcase-filler breather cap.	X X X X X X X X X	04-11		
Replace fuel system filter (gas engine)	X X X X X X X X X	04-08		
Inspect thermactor exhaust emission control system hoses and replace if required (on trucks so equipped)	X X X X X X X X X			
Drain, flush and refill cooling system	EACH 24 MONTHS			04-06
Check and lubricate exhaust control valve. Free up if necessary. (If so equipped)	X X X X X X X X X	03-05		
Clean and adjust distributor points—replace as required (Clean distributor cap)	X X X X X X X X X	04-11		
Check and adjust carburetor—idle speed and fuel mixture	X X X X X X X X X	04-14		
Check and clean external choke mechanism	X X X X X X X X X	04-11		
Check and adjust ignition timing—initial timing, mechanical and vacuum advances, and vacuum retard (if so equipped)	X X X X X X X X X	04-13		

Figure 19-1
Sample Format for Specification for
Scheduled Maintenance Inspections and Services

(4) Check fluid level and all hydraulic brake lines for leaks.

(5) On air brake systems, inspect air brake accessories and all air lines and air tanks for leaks and deterioration; check air brake instruments, control air valves, trailer hose, and glad hands.

b. Lights.

(1) Check all lights, signals, and reflectors.

(2) Check condition of trailer jumper cable.

(3) Check headlights for proper alignment.

c. Instruments, Controls, and Warning Devices. Check all instruments, gages, mirrors, switches, controls, and warning devices for proper functioning and damage.

d. Exhaust System. Check muffler, exhaust and tailpipes, and all connections for leaks.

e. Steering System. Check all steering devices and linkage for wear and damage.

f. Seat Belts. Check all safety belts for wear and proper mounting.

g. Fifth Wheel and Trailer. Check trailer kingpin for wear and damage. Check tow bars, tongue sockets, and safety chains.

h. Tires. Check all tires for damage or excessive wear. Remove and replace tires on front wheel of bus, truck, or truck tractor when the tires in use have less than 4/32-inch of tread at any point on a major tread groove. Tires shall be replaced when tread groove pattern measures less than 2/32-inch.

i. Windshield Wipers, Glass, and Defrosters. Check wipers, glass, and defrosters for proper operation, wear, damage, and deterioration.

j. Other Items. Check all other components required by the States in which the vehicle is operated.

k. Exhaust Emission. Check exhaust emission for compliance with local restrictions.

l. Exhause Emission Controls Tampering Check. Checks for the presence of, or damage to, the catalytic converter, fuel filler inlet restrictor, exhaust gas recirculation valve, air pump, air pump drive belt, and other pollution control devices which are readily visible. Check also for plugged or disconnected vacuum lines.

19-6. Tire Maintenance. Tire and tube maintenance and inspection procedures outlined in Rubber Manufacturers Association (RMA) publications for passenger, truck and bus, off-highway, industrial, and special purpose and farm tires shall be used in maintaining Navy vehicle and equipment tires. These publications are available from the Rubber Manufacturers Association, 1901 Pennsylvania Ave., N.W., Washington, DC 20006.

a. Recapped Tires. The use of recapped tires can produce substantial reductions in operating expenses of vehicles and equipment. Recapping services are available in most areas under the prevailing GSA Federal Supply Schedule. In areas where GSA Schedules are not available for recapping services, it is recommended that an annual contract be awarded for such service under competitive bidding procedures. Recapped tires shall be used where practicable: either full (hot or cold) capped, or top (cold) capped.

b. Tire Inspection. Tires shall be inspected and removed from service in accordance with the safety standards prescribed in RMA publications. Worn tires removed from service but structurally sound shall be recapped for further use. Recapped or retread tires shall not be used on the front wheels of buses. Regrooving of tire treads is prohibited.

CHAPTER 20. PREVENTIVE MAINTENANCE PROCEDURES FOR CONSTRUCTION AND ALLIED EQUIPMENT (LESS WEIGHT HANDLING EQUIPMENT)

20-1. General. Preventive maintenance (PM) principles and general procedures set forth in Chapters 17, 18, and 19 are equally applicable to all equipment other than those prescribed for weight handling equipment (Chapter 21). Maintenance inspections and services shall be performed as prescribed by the manufacturer in the maintenance manual provided with the equipment, at the recommended frequencies. The frequencies shall generally be based on hours of operation as recorded on hour meter, rather than fixed time intervals, except for the daily services performed by the operator.

20-2. Operator's Daily Inspection. All equipment shall be given a daily inspection and service by the assigned operator before, during, and after operation. The operator shall complete this daily requirement in accordance with the procedures set forth in Chapter 18, paragraph 18-7 and NAVFAC Form 11260/4 (Figure 18-8), performing all inspections, services, and adjustments specified. The Transportation Director shall augment these procedures with any additional daily services to be performed by the operator, as recommended by the manufacturer; such instructions shall be explicit and in writing. The operator shall turn in a completed NAVFAC 11260/4 to the equipment dispatcher or his supervisor daily. It shall be the operator's responsibility to ensure that the equipment is safe and reliable. The operator shall stop the equipment immediately when a deficiency develops that renders the equipment unsafe or could damage the equipment.

20-3. Development of Specifications for Inspections and Services. As shown in Figure 20-1, each activity shall prepare a specification that will set forth in writing the inspection and service operation and the frequency with which that operation shall be performed. Data for the specification and schedule shall be obtained from the manufacturer's maintenance manual provided with the equipment; if these data are not provided by the manufacturer, they shall be established by the activity, with frequencies expressed in terms of operating hours. Similarly, adverse local conditions may require the specification of additional operations or frequencies by the activity, beyond or different from those recommended by the manufacturer. Emphasis shall be placed on the inspection and servicing of all control and safety devices. A separate specification and schedule format shall be prepared for each make and model where different. These specifications and schedules shall be approved in writing by the Transportation Director.

20-4. Lubrication Schedule. Equipment shall be lubricated in accordance with recommendations provided by the manufacturer in his maintenance shop manual or operator's manual provided with the equipment. Where such data are not available, they shall be obtained from the manufacturer by the activity. In the absence of such data, the lubrication plan set forth in Figure 20-2 shall be used.

SPECIFICATION FOR SCHEDULED MAINTENANCE INSPECTIONS AND SERVICES									
VEHICLE MAKE	MODEL(S)								YEAR(S)
OPERATION	SERVICE INTERVAL								See Manual Page
1000 MILES →	6	12	18	24	30	36	42	48	
ENGINE									
Change engine oil and filter	X	X	X	X	X	X	X	X	03-12
Clean and refill oil bath air cleaner (if so equipped)	X	X	X	X	X	X	X	X	03-03
Replace dry-type air cleaner filter (6 cyl.)		X		X		X		X	03-03
Replace dry-type air cleaner filter (8 cyl.)				X				X	03-03
Test crankcase emission system. Clean system and replace emission control valve if required.	X	X	X	X	X	X	X	X	04-11
Clean crankcase emission system hoses, tubes, fittings, carburetor spacer and replace if necessary. Replace emission control valve.		X		X		X		X	04-11
Clean crankcase filler breather cap.	X	X	X	X	X	X	X	X	04-11
Replace fuel system filter (gas engine)				X				X	04-08
Inspect thermactor exhaust emission control system hoses and replace if required		X		X		X		X	
Drain, flush and refill cooling system	EACH 24 MONTHS								04-06
Check and lubricate exhaust control valve. Free up if necessary. (If so equipped)	X	X	X	X	X	X	X	X	03-05
Clean and adjust distributor points—replace as required (Clean distributor cap)		X		X		X		X	04-11
Check and adjust carburetor—idle speed and fuel mixture	X		X		X		X		04-14
Check and clean external choke mechanism	X		X		X		X		04-11
Check and adjust ignition timing—initial timing, mechanical and vacuum advances, and vacuum retard (if so equipped)	X		X		X		X		04-13

Figure 20-1
 Sample Format for Specification for Scheduled Maintenance Inspection and Services for Construction and Allied Equipment

SIMPLIFIED LUBRICATION PLAN FOR CONSTRUCTION EQUIPMENT

Lubrication point	Lubrication interval-hours	Lubricant type and specification
Engine, gasoline, LPG, and diesel	100-200	Heavy duty engine oil
Engine accessories—Oil lubricated	100	for gasoline engines MIL-L-46152
Oil can points—moderate loads	As required	for diesel engines MIL-L-24016
Automatic power transmission	1000	Transmission fluid
Gear boxes, transmissions, differential	1000	
Chain drives	100	
Flexible couplings	1000	Gear oil MIL-L-2105C
Universal joints—oil lubricated	1000	
Oil points—severe loads	10	
Hydraulic mechanisms	1000	
Air compressors	200	
Electric motors and generators—oil lubricated	1000	Hydraulic oil -MIL-L-2104C or manufacturer recommended
Grease Fittings—Linkage, plain bearings	10	
—Ball and roller bearings	100	Commercial multipurpose grease
Hand packed bearings	100	automotive
Wheel bearings	1000	
Track rollers	10	
Exposed gears	As required	
Dipper stick	As required	
Wire rope and cable	As required	Exposed gear and wire rope grease MIL-G-18458.

Figure 20-2
Simplified Lubrication Plan
for Construction Equipment

CHAPTER 21. MAINTENANCE MANAGEMENT OF WEIGHT HANDLING EQUIPMENT

21-1. Introduction and Applicability. This chapter prescribes maintenance management procedures covering maintenance scheduling, inspection, load testing, certification, and documentation requirements for weight handling equipment. These procedures are applicable Navy-wide to all weight handling equipment described and illustrated in Appendix I that are assigned to and on the plant account of naval shore installations, including permanently-mounted chainfalls and hoists. This includes all mobile cranes designated with "USN" numbers with an 82, 84, or 12 prefix to the number. Except for floating cranes hull designation "YD," and "USN" numbered weight handling equipment assigned to ships or used on craft afloat, the procedures set forth herein are not applicable to weight handling equipment installed on naval vessels. Similar requirements for cranes installed on naval vessels are covered in applicable Naval Sea Systems Command (NAVSEA) technical publications. Unless otherwise specifically prescribed herein, the procedures prescribed in this chapter conform to requirements of NAVSEA 0989-030-7000 Lifting Standard for weight handling equipment used in support of the Nuclear Propulsion Program. Where additional or differing requirements are prescribed in NAVSEA 0989-030-7000, this document is so referenced. In all cases where activities are using weight handling equipment in special purpose service, they shall thoroughly understand and strictly comply with all requirements set forth in NAVSEA 0989-030-7000 Lifting Standard (see paragraph 21-16). The certifying officer shall determine the maintenance, inspection, test and certification requirements for cranes rented from outside contractors. Contracts should be so documented that responsibilities are clearly defined. The test and inspection procedures prescribed in this chapter are intended to test the safety and reliability of a crane. These procedures shall be used as a minimum. If the crane is equipped with features not specifically covered by these procedures, those features should be inspected and tested for proper operation. When omissions or errors in crane inspections and test procedures specified herein are suspected, notify NAVFACENGCOM (Code 10W). Appendix A contains definitions used throughout this chapter. Sample formats shown throughout this chapter are to be used as a guide. Activity formats may be substituted, provided the activity format includes the information required by the samples.

21-2. Maintenance Inspections. Maintenance inspections of weight handling equipment will, except as noted, be performed at the frequencies and in the detail specified in this chapter. In general, inspections shall consist of observing the functioning of the specified components and parts before, during and after operations. Examination shall be by sight, sound, touch; and, as necessary, instrumentation, nondestructive testing, and disassembly. The extent of disassembly shall be determined by the inspector or higher authority, as necessary, to assist in proper diagnosis. Disassembly should be generally limited to (1) apparent or suspect abnormal conditions or functions, (2) where and at intervals recommended by the manufacturer, and (3) where local experience with failure or malfunction indicates further in depth inspection is necessary. Final authority to determine the extent of inspection in depth and detail including disassembly rests with the certifying officer. Primary emphasis during inspections shall be given to ensuring maximum safety by maintaining all load bearing and load controlling parts and safety devices in a

safe and sound working condition. Inspectors will not engage in calculated risks or depend on their judgment alone where there is a doubt in their mind regarding a questionable condition of such parts. Questionable condition of load bearing and load controlling parts and safety devices shall be referred immediately via prescribed channels to appropriate engineering codes and, if necessary, to the certifying officer for resolution. In those instances where a failure of a load bearing or load controlling part occurs and for other malfunctions or failures considered significant by the activity, a deficiency report shall be prepared detailing the malfunction or failure and the corrective action taken. Deficiency reports shall be included in the equipment history record file (see paragraph 21-21). A copy of this deficiency report shall be forwarded to the cognizant EFD and to NAVFACENGCOM (Code 1202) for information. NAVFAC 11450-1 applies.

21-3. Special Definitions. The following are definitions of essential terms used in this section. See Appendix A for glossary of additional terms used in reference to weight handling equipment.

a. Major Deficiency. A deficiency of a load bearing or load controlling part.

b. Minor Deficiency. A deficiency which is not associated with a load bearing or load controlling part.

c. Safety Device. Those parts of the equipment which inform or warn the operator of some condition, or stop or lock some feature of the equipment, the failure of which could result in damage to or failure of the weight handling equipment.

d. Load Bearing Parts. Those parts of the weight handling equipment which support the load and upon failure could cause dropping, uncontrolled shifting, or movement of the load.

e. Load Controlling Parts. Those parts of the weight handling equipment which position, restrain, or control the movement of the load, a malfunction of which could cause dropping, uncontrolled shifting, or movement of the load.

21-4. Inspection Specification. Crane maintenance specifications are set forth in Appendices J and K for crane Categories 1, 2, and 3. These prescribe the type of inspection (A, B, C, or Annual), the components and parts to be inspected, and the inspection action. These inspections, as a minimum, shall be performed at the frequencies prescribed in paragraph 21-6. Because of the various makes and models of cranes in the Navy inventory, and because of unique or special components; the scope, depth, and detail of these specifications may require additional instructions. In addition, each activity shall augment these specifications with specification data sheets, guidance, and technical criteria as necessary for use by inspectors in checking performance, physical dimensions, measurements for wear, adjustments, settings, and tolerances. Such technical data and criteria shall be abstracted from manufacturer's technical manuals, maintenance experience, and other authoritative technical sources.

21-5. Inspection Action. Each activity will complete a Maintenance Inspection Specification and Record format in accordance with sample formats set

forth in Figure 21-1. The maintenance inspection specifications set forth in Appendices J and K shall be included in this record format. These record formats shall be used to record conditions at each inspection and filed in the equipment history record file. All inspection determinations shall be recorded as either satisfactory, unsatisfactory, or not applicable (NA). Where measurements are specified or required for acceptance, the actual readings shall be recorded in the "Remarks." Where an unsatisfactory condition is found, the item shall be identified in the "Remarks" block together with a statement of the condition observed. Corrective action in terms of adjustments, repairs, or replacements of items shall be detailed on a Shop Repair Order (SRO) or other appropriate document. The SRO or other document number shall be recorded on the Maintenance Inspection Specification and Record format. Replacement of all load bearing and load controlling parts shall be of identical material and dimensions of those of the original design. Where circumstances require substitution of either material or design configuration, such decisions shall be referred to the activity engineering organization for resolution. Activities other than shipyards shall comply with the requirements for handling alterations and modifications set forth in Chapter 24 of this publication. Shipyard engineering organization shall comply fully with requirements of NAVSEAINST 11200.2, Alterations/Modifications of Shipyard Weight Handling Equipment. After work is completed, the component or part shall be reinspected by the original inspector where practicable. The inspection shall include an operational test where appropriate. Where the adjustment, repair, or replacement has been performed satisfactorily and the original unsatisfactory condition eliminated; the inspector shall record this action as corrected on the repair document.

21-6. Maintenance Inspection Type and Frequency. Whenever practical, appropriate maintenance inspections should be scheduled to be accomplished in conjunction with modifications, overhaul, and annual condition inspection. Routine inspections will be scheduled and performed for the various categories of weight handling equipment in accordance with the following.

a. Category 1. Includes cranes designated as portal, portal/gantry (gas or diesel), hammerhead, locomotive, truck, cruiser, crawler, stiff leg, air-craft crash, derrick, floating, tower, and container.

(1) Criteria. Engine operating hours as recorded on hour meter on the main engine or time intervals in calendar months at the option of the activity. Schedule must establish either one or the other of these criteria (not either or whichever comes first). A Type B (see following paragraph) inspection must be accomplished before option to change is exercised. A Type B inspection shall be performed annually irrespective of operating hours.

(2) Type Designation and Frequency.

(a) Type "Daily." By operator, using the Crane Operator's Daily Checklist (Figure 21-2).

(b) Type A Inspection. An inspection of items specified in Appendix J to be performed each 500 engine operating hours (plus 50 operating hours) or 3 calendar months (+10 days) of operation.

MAINTENANCE INSPECTION SPECIFICATION AND RECORD

SHEET 1 OF 7

Crane	Type	Manufacturer	Capacity	Date	
MC5	TRUCK CRANE	FMC	40,000 lbs	10-24-82	
Prior Inspection		Current Inspection		Legend: Check under condition	
Hours	Type	Hours	Type	"S" = Satisfactory "C" = Corrected	
4658	A	5158	C	"U" = Unsatisfactory "NA" = Not Applicable	
Item No.	Inspection Frequency	Items to be Inspected	Crane Maintenance Inspection Specification	Inspected	Condition
	A B C			S U C	NA
1		Cooling System Hoses, Thermostat, Pump	Inspect hoses for cracks and clamps for tightness. Check for leaks, shutter operation and antifreeze. Check water pump for noise and leaking seals.	a. Main b. Main c. Aux	S NA
2		Lube Oil Lines and Lube Pressure	Inspect lube oil lines for loose connections, leakage and damage. Check gage for proper lube oil pressure. (See Specifications).	a. Main b. Main c. Aux	S NA
3		Fuel Oil Lines	Inspect fuel oil lines for loose connections, leakage and damage. Check fuel pressure gage for proper operation.	a. Main b. Main c. Aux	S NA
4		Air Starting Lines	Inspect air lines for loose connections, leakage and damage.	a. Main b. Main c. Aux	S NA
5		"V" Belts	Inspect drive belts on fan, water pump, oil pumps, supercharger, alternator, and external fuel oil transfer pumps for belt tension and wear.	a. Main b. Main c. Aux	S NA
73		Boom Hoist Motor	Inspect for weather damage and moisture. Inspect collector rings and commutator for pits, burned spots, or uneven wear. Check motor brushes and brush tension. Inspect leads, insulators, insulation, loose wires and connections. Check for any unusual noise and inspect for loose hold-down bolts, bent shafts, covers, and lubrication	a. Boom b. Main c. Aux d. Whip e. Swing f. Trolley	S NA NA NA NA NA NA
74		Main Hoist Motor	Inspect for weather damage and moisture. Inspect collector rings and commutator for pits, burned spots, or uneven wear. Check motor brushes and brush tension. Inspect leads, insulators, insulation, loose wires and connections. Check for any unusual noise and inspect for loose hold-down bolts, bent shafts, covers, and lubrication	a. Boom b. Main c. Aux d. Whip e. Swing f. Trolley	S NA NA NA NA NA NA
75	N A	Trolley Motor	Inspect for weather damage and moisture. Inspect collector rings and commutator for pits, burned spots, or uneven wear. Check motor brushes and brush tension. Inspect leads, insulators, insulation, loose wires and connections. Check for any unusual noise and inspect for loose hold-down bolts, bent shafts, covers, and lubrication	a. Boom b. Main c. Aux d. Whip e. Swing f. Trolley	NA NA NA NA NA NA

Remarks (Refer to Item Number): 36(4)(a) MAIN HOIST WIRE ROPE HAS 8 BROKEN WIRES IN ONE STRAND IN ONE LAY.

Unsatisfactory Items Corrected on SRO Number/s	→			
Mechanical Inspector (Signature)	Date	Electrical Inspector (Signature)	Date	

Figure 21-1
Sample Maintenance Inspection Specification and Record

CRANE NO. M. C. 5	TYPE/CAP TRUCK CRANE 20 TON	LOCATION/ASSIGN RER 13	SHIFT ① 2 3	HOUR METER START STOP SOS	HRS OPERATED 8	DATE 10-17-82	
INSTRUCTION - Check all items indicated. Inspect and indicate as satisfactory = S. unsatisfactory = U, or not applicable = NA							
3 OPERATOR CAB INSPECTION							
4 OPERATION INSPECTION							
1 WALK AROUND INSPECTION		2 MACHINERY HOUSE INSPECTION					
a	Safety guards & plates	S	U	a	Gauges	S	U
b	Carrier frame/rotate base	*	S	b	Warning/indicator lights	S	S
c	General hardware	S		c	Controls/brakes	S	S
d	Wire rope	*	S	d	Lubrication	S	S
e	Reeving	*	S	e	Battery	S	S
f	Block	*	S	f	Lights	S	S
g	Hook	*	S	g	Glass	S	S
h	Sheaves	*	S	h	Clutch/brake linings	S	S
i	Boom/jib	*	S	i	Electric motors	S	S
j	Gantry/pendents/boom stops*	S		j	Warning tags	S	S
k	Walks/ladders/handrails	S		k	Fire extinguisher(s)	S	S
l	Windlocks/chocks/stops	S		m	Tires/wheels/tracks	S	S
n	Leaks, fuel/lube/oil/water	S		o	Radius indicator	S	S
p	Outrigger/locking device	*	S				
INSTRUCTIONS - Inspect all applicable items indicated, each shift. Suspend all operations immediately when observing an unsatisfactory condition of any item indicated above with an asterisk (*). In addition, suspend operation when any unsafe condition is observed and immediately notify supervisor. Other conditions not affecting safety shall be noted under "Remarks" and reported to supervisor.							OPERATORS SIGNATURE <i>E.J. Mc Gee</i> DATE 10-17-82
REMARKS N/A							SUPERVISOR SIGNATURE <i>Daniel Webster</i> DATE 10-17-82
CRANE OPERATORS DAILY CHECKLIST							

Figure 21-2
Sample Crane Operator's Daily Checklist

(c) Type B Inspection. An inspection of items specified in Appendix J to be performed each 2,000 engine operating hours (plus 200 operating hours) or 12 calendar months (+30 days) of operation. A Type "B" inspection shall also include all items designated under Type A inspection.

(d) Type C Inspection. An inspection of items specified in Appendix J to be performed each 8,000 engine operating hours (plus 800 operating hours) or 36 calendar months (+2 months) of operation. A Type "C" inspection shall also include all items designated under Type "A" and "B" inspections.

b. Category 2. Includes cranes with a rated capacity of 20,000 pounds or over designated as overhead traveling (bridge), gantry (electric), cantilever gantry (electric), semigantry (electric), pillar jib, jib, pillar, monorail, fixed hoist, and wall. Chainfalls and hoists not permanently fixed to a structure are excluded.

(1) Criteria. Daily and annually.

(2) Type Designation and Frequency.

(a) Type "Daily." By operator, using Crane Operator's Daily Checklist (Figure 21-2).

(b) Type "Annual." An annual inspection of items specified in the Crane Maintenance Inspection Specification (Appendix K) to be performed in conjunction with the Annual Condition Inspection and Load Test.

c. Category 3. Includes cranes with a rated capacity under 20,000 pounds designated as overhead traveling (bridge), gantry (electric), cantilever gantry (electric), semigantry (electric), jib, pillar, pillar jib, monorail, fixed hoist, and wall. Chainfalls and hoists not permanently fixed to a structure are excluded.

(1) Criteria. Daily and annually.

(2) Type Designation and Frequency.

(a) Type. Operational check by user shop (see paragraph 21-10).

(b) Type "Annual." An annual inspection of items specified in the Maintenance Inspection Specification (Appendix K) to be performed in conjunction with the Annual Condition Inspection and Load Test.

21-7. Lubrication and Servicing. In addition to the inspection specifications prescribed in paragraph 21-4, each activity shall develop local instructions and schedule and perform lubrication and servicing. Lubrication instructions shall be developed using the manufacturer's manuals and instructions as a guide. Activity and Navy experience and crane usage may be used as a basis for modifying the manufacturer's program. These actions will be recorded on a SRO, Operator's Daily Checklist, or other documents as appropriate. The documentation recording these actions will be maintained in the equipment history record file. Normally, these services shall be in the

manner specified and in accordance with the operating or time intervals developed locally or recommended by the manufacturer. Inspectors shall perform a detailed review of maintenance records during prescribed inspections to ensure that prescribed lubrication and servicing are being properly performed as specified.

21-8. Operator's Daily Check (Category 1 and 2 Cranes). Operators of Category 1 and 2 cranes shall perform a daily inspection of their assigned equipment. Crane operator's daily checklist (ODCL) similar to Figure 21-2 shall be used for this purpose. The specific format and operator inspection elements shall be developed and prescribed by each activity for each type of machine. As an option, an operator's daily log format may be used in lieu of the single card format (ODCL). This log is to remain on the crane for a period not to exceed 1 month. In either case, the checklist elements will be signed off by the operator after his preoperation check. Where the single card (ODCL) is used, the operator will turn in the card to his supervisor after each shift. Where the log format is used, the crane operator supervisor shall make random surveillances of compliance to daily operator inspection requirements and document these surveillances in the "Remarks" section of the monthly log. Irrespective of the format used, the operator shall visually inspect and check each item prescribed on the checklist. The operator's inspection shall include, as minimum preoperation inspection, operating the machine without load through all motions, using all controls and ensuring the proper operation, and functioning of such controls, safety devices, gauges, meters, warning signals, and devices and limit switches. Test of limit switches shall include upper hoist and upper and lower boom limit switches. Lower hoist limit switches need only be tested where operationally possible. However, the lower hoist limit switch will be tested prior to any lift operation which could result in its activation. Daily check of upper hoist and upper and lower boom limit switches may be waived by the certifying officer when the crane has temporarily installed slow speed micro drive in operation.

21-9. Operator-Detected Deficiencies. When an operator, during the daily check or during operation, observes a deficiency of a load bearing or load controlling part or safety device (major deficiency) or an operating condition which would result in the slightest loss of control or otherwise render the crane unsafe, he shall immediately secure the crane from further operation and notify his supervisor of the deficiency observed. The supervisor in turn shall immediately report the crane deficiency to the crane inspection organization for diagnosis of the deficiency and initiation of corrective repair action, including engineering resolution as necessary. The crane shall not be returned to service until such major deficiencies are corrected, and the corrective repair is approved by the crane inspector (see paragraph 21-12). In addition, the operator shall note all minor deficiencies on the single card (ODCL) turned in to the supervisor. Where the operator's daily log format is used, the activity shall prescribe procedures for notifying the supervisor of minor deficiencies. Procedures shall be prescribed for the crane operator's supervisor to advise in turn the crane inspection organization of all minor deficiencies.

21-10. Operator Check (Category 3 Cranes). The user shop shall have the responsibility for the safe and proper operation of assigned cranes and for reporting problems to the cognizant crane inspection organization.

21-11. Annual Condition Inspection and Load Test. It is the purpose of the annual condition inspection to ensure that the overall structural mechanical and electric components of the equipment have been maintained in a safe and serviceable condition and are functioning properly. It is the purpose of the load test to ensure by actual overloading that the equipment is capable of safely lifting and moving the rated load through all design motions.

21-12. Condition Inspection, Load Test, and Certification Frequency. Each unit of weight handling equipment shall be condition inspected, load tested, and certified at least once annually as prescribed in paragraphs 21-13, 21-14, and 21-15. In addition, a selective inspection and either a load test or other appropriate proof test, and certification shall be made after an adjustment, repair, replacement, or alteration/modification of a load bearing or load controlling part or component. The load test or other appropriate proof test need only be performed where the adjustment, repair, replacement, or alteration/modification if not performed correctly could in fact result in dropping, uncontrolled shifting, or movement of the load. The inspection, load test, or other appropriate proof test, and certification, may be limited where practical to those parts and components of systems affected and shall be such as to ensure that the adjustment, repair, replacement, or alteration/modification has been performed correctly and that the movement of the crane or the load starts, stops, or reverses as indicated by the setting of the crane operating controls. However, if holding strength is a function of the parts or components of the system affected by the work, a load test and recertification shall be performed. The intent of the testing will be to preclude the dropping, uncontrolled shifting, or movement of the load. Due to redundancy of travel brakes and the ratio of unloaded to loaded weight of portal cranes, a no load operational test is satisfactory after repair or adjustment to travel brakes, and recertification is not required.

21-13. Certification. The certifying officer is responsible for ensuring the safety and reliability of all weight handling equipment at the activity. The certifying officer shall be designated in writing by letter by the Commanding Officer of the activity. The certifying officer shall, in turn, designate the authorized test directors and inspection and test personnel. Certifications shall be based on the condition inspection and load tests prescribed in paragraphs 21-14, and 21-15 as well as selective load tests prescribed in paragraph 21-12. These inspections and tests shall be performed by technically competent inspection and test personnel under the direction of a designated test director. Upon successful completion of the condition inspection and load test, a Certification of Load Test and Condition Inspection shall be signed by the test director, inspection and test personnel, and the certifying officer. The certifying officer shall withhold certification pending the correction of all inspection deficiencies existing after load test which, in his judgment, could cause unsafe conditions. The certificate of load test and condition inspection should be similar to that shown in Figure 21-3. A card or tag with the crane identification number, certified capacity, and date of test signed by the test director shall be posted in a conspicuous location on

CERTIFICATION OF LOAD TEST AND CONDITION INSPECTION

Crane No.	Type	Rated Cap lbs. feet	Boom Length	Location	Test Date
M.C. 5	TRUCK CRANE	40,000 15	25 FT.	PIER 4	10-26-82
TYPE C. INSPECTION					
Category 1 Cranes					
Hoist	Test Load %	Minimum Radius Feet	Maximum Radius Feet	Crane Test Procedures Paragraph Numbers	
Main	110	44,900 13	17,765 2.8	1d(1)	Sd(2)(e)
Aux	110	—	2,086 —	1d(2)	Sd(3)
Whip	NA	—	—	1d(3)	SC
Hook Throat Opening Before Test After Test					
Main Hook	4 7/16	4 7/64		1c(1)	sec(1)
Aux Hook	3 1/64	3 1/64		1c(2)	sec(2)
Whip Hook	—	—		2a	sec(3)
Category 2 Cranes					
Hoist	Test Load %	Minimum Radius Feet	Maximum Radius Feet	Crane Condition Inspection Record Item Numbers	
Main	—	—	—	6 ✓	Items Inspected
Aux	—	—	—	7 ✓	11 ✓
Hook Throat Opening Before Test After Test					
Main Hook	—	—	—	8 ✓	16 ✓
Aux Hook	—	—	—	9 ✓	21 ✓
Category 3 Cranes					
Hoist	Test Load %	Minimum Radius Feet	Maximum Radius Feet	Crane Condition Inspection Record Item Numbers	
Main	—	—	—	10 ✓	26 ✓
Aux	—	—	—	11 ✓	31 ✓
Hook Throat Opening Before Test After Test					
Main	—	—	—	12 ✓	36 NA
Aux	—	—	—	13 ✓	37 NA
Main 100% Test					
Remarks: NA					
It is further certified that the crane identified above is satisfactory to lift its rated capacity at its rated radii..					
Test Director (Signature)	Date				
Inspector (Signature)	Date				
Certifying Official (Signature)	Date				
Nolan Crowley					

Figure 21-3
Sample Certification of Load
Test and Condition Inspection

or near the crane. All certifications are automatically void after 1 year, after exceeding the certified rated capacity during operations, or after an adjustment, repair, replacement, or alteration/modification of a load bearing, load controlling part or component (see paragraph 21-12). Exceeding the certified rated capacity during a condition inspection and load test conducted by authorized test personnel of the activity or EFD will not void a current certification and validation. The certifying officer may, on a specific case basis, authorize in writing and in advance, operational lifts exceeding the certified rated capacity but less than the nominal test load. Following such overload operation, the crane system affected by overload shall be inspected, appropriately tested, and recertified prior to further lifting operations.

a. Extension of Certification and Schedules. When an emergent or other contingent condition exists precluding the timely certification of a crane, the Commanding Officer may approve in writing a temporary extension of the prior annual certification. Authority to extend such certifications shall not be delegated. Inspections prior to extending certifications shall be specified by the certifying officer. The Commanding Officer may delegate to the certifying officer authority to extend or adjust a prescribed maintenance inspection or lubrication and servicing schedule where adherence is in conflict with a work schedule or results in a duplication. Each authorization to extend or adjust a prescribed maintenance inspection, lubrication, or servicing schedule shall be in writing and filed in the equipment history record file for the crane in question.

21-14. Condition Inspection. A condition inspection shall be performed before, during, and after the load test. A Crane Condition Inspection Record similar to that shown in Figure 21-4 should be used to record results of the inspection. The inspection shall, in general, be by sight, sound, and touch with the depth and detail being normally limited to that necessary to verify the overall condition required by paragraph 21-11. Each item on the Crane Condition Inspection Record shall be marked as either satisfactory or unsatisfactory. Where the items are not applicable, the symbol NA shall be used or the appropriate block(s) blanked out. A description of unsatisfactory conditions shall be noted in the "Remarks" portion of the format. In the event that deficiencies of load controlling and load bearing parts are identified by these inspections, the deficiencies shall be corrected prior to starting or completing the load test. Corrective action shall be properly documented. If a load bearing or load controlling part is involved, a load test shall be repeated to test only the component(s) corrected. If a selective load test is performed, a condition inspection shall be performed on all items in the Crane Condition Inspection Record which experienced greater than normal loading to ensure that the load test has not caused any damage. A record of this retest shall be recorded in the "Remarks" portion of the Crane Condition Inspection Record.

21-15. Load Testing. The load test shall be performed in accordance with the applicable procedures set forth in Appendix L and any special requirements specified for the particular crane by the manufacturer. The test results,

CRANE CONDITION INSPECTION RECORD

Crane No. M.C.5	Type TRUCK CRANE	Location Pier 4	Operator names E.J. McGEE	Operator License Nos. N62688-000-6-30
Purpose of inspection: TYPE C INSPECTION			Date started 10-25-82	Date completed 10-26-82
Item No.	Item description			B D A Insp/ Init.
1	Bent, cracked, or corroded structural members			S S S LS
2	Cracked or corroded welds			S S S LS
3	Loose, broken, missing, or deteriorated rivets or bolts			S S S LS
4	Inspect all wire rope for wear, broken wires, corrosion, kinks, damaged strands, crushed or flattened sections, condition of sockets, and dead end connections. Check for proper lubrication and evidence of proper inspection of idler sheaves and saddles. See Appendices J and K for detailed inspection requirements and rejection criteria.			S S S LS
5	Inspect hooks for cracks, sharp edges, and distortion. Verify disassembly, inspection, and nondestructive test (NDT) as applicable. See paragraph 1.d of Appendix L for detailed requirements.			S S S LS
6	Inspect all brakes and clutches for proper operation. Spot check components for proper adjustment and acceptable wear.			S S S LS
7	Check all controls for proper condition and operation			S S S LS
8	Check all control components for proper condition and operation			S S S LS
9	Inspect all limit switches for condition and proper operation			S S S LS
10	Ensure each drum has minimum of two complete wraps of wire rope at lowest working level			S S S LS
11	Check load indicators for condition and working accuracy			S S S LS
12	Inspect all mechanical equipment which is reasonably accessible for wear, cracks, and alignment			S S S LS
13	Inspect where practical for worn, defective, or misaligned bearings, bushings, shafts, pins, and gears.			S S S LS
14	Check components for excessive heat, vibration, noise, and oil leaks			S S S LS
15	Inspect sheaves for wear, roughness, free-turning, and alignment. Gauge sheave groove where possible.			S S S LS
16	Inspect for excessive wear of wheels, tires, rollers and roller paths or rails			S S S LS

Figure 21-4 (Front)
Sample Crane Condition Inspection Record

Item No.	Item Description	B	D	A	Insp/Init.
17	Inspect for excessive wear of chains and sprockets. Measure chain stretch of load chains.	S	S	S	LS
18	Verify that correct certified capacity charts or hook load rating data is in view of operator and/or rigging personnel	S	S	S	LS
19	Inspect operator's cab for cleanliness and operation of all equipment	S	S	S	LS
20	Check machinery house for cleanliness, proper safety guards, warning signs, and storage of tools and equipment	S	S	S	LS
21	Check operation of all indicators, warning devices, and lights	S	S	S	LS
22	Check for proper type and condition of all fire protection equipment	S	S	S	LS
23	Verify that pressure vessel inspection certificates are posted and current (see NAVFAC MO 322, Volume 2 or appropriate document for test procedures)	S	S	S	LS
24	Check condition and function of outriggers, pads, boxes, wedges, and cylinder mountings. Check level indicators	S	S	S	LS
25	Check center pin nut and stediment by observing operational behavior during load test (see paragraph 2.b.(2), Appendix L)	N Δ	N Δ	N Δ	LS
26	Check travel, steering, braking, and locking devices for condition and proper operation	S	S	S	LS
27	Check radius indicator for accuracy by measuring actual radius in at least two boom positions	S	S	S	LS
28	Check pawls, ratchets, and spuds for proper engagement and operation of interlocks	S	S	S	LS
29	Inspect tanks, lines, valves, drains, filters, and other components of air systems for leakage and proper operation	S	S	S	LS
30	Inspect reservoirs, pumps, motors, valves, lines cylinders, and other components of hydraulic systems for leakage and proper operation	S	S	S	LS
31	Check engines and engine-generator sets for proper performance, safety, and system leakage	S	S	S	LS
32	Inspect for bent, cracked, corroded, or dented boom members	S	S	S	LS
33	Check condition of counterweights, ballast, and securing fasteners	S	S	S	LS
34	Check all compartments (voids) for water tightness	NA	NA	NA	LS
35	Check accuracy of list and trim indicators against design data or previous test data	NA	NA	NA	LS

Remarks:

NA

Legend: B--before; D--during; A--after

Larry Shirkert
Inspector Signature/Date 10-26-82

Harry Bates
Test Director Signature/Date

10-26-82

Figure 21-4 (Back)
Sample Crane Condition Inspection Record

together with a certification of the applicable portions of the test procedures used, shall be entered in the Certification of Load Test and Condition Inspection. The following test load and speed criteria shall be used in all load tests:

a. Test Loads. The assembled test load including rigging shall be within +5/-0 percent of the nominal (calculated) test load. For mobile cranes, the test load shall include the hook and load block. For other types of cranes, the test load shall be that load suspended from the hook. Test weights must be certified by the facility. Weights shall be measured using calibrated equipment with a minimum accuracy of +2 percent. Dynamometers or other load measuring devices may be used in lieu of weights when appropriate. Test load tolerance and accuracy when using load measuring devices shall be the same as required for weights.

b. Test Speeds. During tests, normal operating speeds shall be employed. Rated speeds in accordance with specifications need not be attained. Emphasis shall be placed on the ability to safely control loads through all motions at normal speeds.

21-16. Requirements for Special Purpose Service. This instruction does not provide authority to modify or otherwise deviate from the requirements prescribed in NAVSEA 0989-030-7000, where applicable. All inspection, load testing, and certification requirements of NAVSEA 0989-030-0700 for weight handling equipment designated for "special purpose service," shall be separately and specifically identified, documented, and included in the equipment history record file.

21-17. Capacity Ratings. The test loads and capacity ratings of all weight handling equipment used and recorded in the Certification of Load Test and Condition Inspection shall be expressed in pounds.

21-18. Stability Testing and Calibration. All newly acquired used locomotive, truck, cruiser, crash, and crawler cranes will be initially tested for stability in those cases where the manufacturer's load and stability data are not available, or where the acquiring activity may suspect that alterations/modifications affecting stability may have been previously performed. In addition, all locomotive, truck, cruiser, crash, and crawler cranes shall be tested for stability after alterations/modifications are performed that affect original stability ratings. The stability test and rating shall be conducted as follows.

a. Margin of Stability. The margin of stability for determination of load ratings, with booms of stipulated lengths at stipulated working radii for the various types of crane mountings, is established by taking a percentage of the loads which will produce a condition of balance with the boom in the least stable direction relative to the mounting. The load ratings shall not exceed the following percentages for cranes with the indicated types of mounting under conditions stipulated in paragraphs b. and c. following.

<u>Type of Crane Mounting</u>	<u>Maximum Load Ratings (% of Balance Point Load)</u>
Locomotive, without outriggers	(see paragraph 21-19 following)
Booms 60 feet or less	85
Booms over 60 feet	85 ¹
Locomotive, using outriggers	
fully extended	80
Crawler, without outriggers	75
Crawler, using outriggers	
fully extended	85
Truck and wheel mounted without outriggers extended	(see paragraph 21-19 following)
Truck and wheel mounted with outriggers fully extended	85

b. For Locomotive Cranes. The following stipulations shall govern the application of the values in paragraph a. preceding.

(1) Tipping with or without the use of outriggers occurs when half of the wheels farthest from the load leave the rail.

NOTE: As a precaution while testing, for free ratings, outriggers should be loosely applied; rail clamps should not be used.

(2) The crane shall be standing on track which is level within 1 percent grade.

c. For Truck, Cruiser, and Crawler Cranes. Stipulations governing the application of the values in paragraph a. above for truck, cruiser, and crawler mounted cranes shall be in accordance with Crane Load Stability Test Code, SAE J765a (Appendix M).

d. Balance Point Loads. Balance point loads from which ratings are determined shall be applied under static conditions only, i.e., without dynamic effect of hoisting, lowering, or swinging.

e. Rated Loads. The weight of all auxiliary handling devices such as hoist blocks, hooks, and slings shall be considered a part of the rated load.

f. Other Stability Factors. The effectiveness of these preceding stability factors will be influenced by such additional factors as freely suspended loads, track, wind or ground conditions, condition and inflation of rubber tires, boom lengths, proper operating speeds for existing conditions, and in general, careful and competent operation. All of these shall be taken into account by the user.

g. Radius of Load. Radius of the load is the horizontal distance from a projection of the axis of rotation to the center of vertical hoist line with load applied.

¹Unless this results in less than 30,000 pound-feet net stabilizing moment about the rail, which shall be minimum with such booms.

h. For Special Purpose Service. See special stability requirements in NAVSEA 0989-030-7000.

21-19. Free Rated Capacities. The maximum free rated capacities of truck, cruiser, crash crawler, and locomotive cranes when lifting and/or traveling with a load shall be as follows.

a. Cranes Equipped With Outriggers (Outriggers Not Deployed).

(1) Over the Rear and Over the Front. All cranes--manufacturer's rated capacity.

(2) Over the Side. All cranes where the manufacturer specifies a free rated over the side capacity. Capacity must be certified by the certifying officer. Capacity shall not exceed 50 percent of the balance point load. The balance point load may be determined by actual test (See Appendix M), or by calculating as follows:

$$\text{Balance Point} = \frac{\text{Manufacturer's free rated capacity}}{0.85}$$

b. Cranes Not Equipped With Outriggers. This applies to most crawlers and warehouse cranes, and some cruiser and locomotive cranes; use manufacturer's rated capacity over the rear and over the side.

c. Aircraft and Helicopter Crash Cranes Afloat and Ashore. When assigned to crash rescue duty--manufacturer's rated capacity.

21-20. Wire Rope End Connection. End connections on wire rope used on weight handling equipment shall be limited to the following and subject to the further limitations prescribed herein.

a. Speltered Sockets. Forged steel speltered socket terminal end connections are approved for all weight handling equipment. Speltered socket end connections shall be fabricated in accordance with NAVSEA S9086-BK-STM-000/CH-613 (Chapter 613), Wire and Fiber Rope and Rigging; or Uniform Method and Standard 0613-608 (formerly 0602-608). The installed socket connection shall be inspected and load tested when weight handling equipment is configured as a crane for lift hook work.

b. Swaged Connections. Swaged end connections are approved for use as wire rope terminal end connections for weight handling equipment. Swaged connections shall be fabricated on a swage press designed for such purposes, using procedures and parts approved by the swage press manufacturer. The installed swaged connections shall be inspected and load tested when weight handling equipment is configured as a crane for lift hook work.

c. Wedged Sockets. Except as noted herein and subject to the approval of the activity's certifying officer, wedge socket end connections may be used on mobile weight handling (crawler, truck, cruiser, locomotive) equipment used in facilities maintenance and construction functions when terminal end connections on such equipment are subject to frequent changeout due to conversions in boom length, reeving, and/or installation of excavating attachments. The installation of wedge sockets shall be inspected and load tested in accordance

with paragraph 21-12 when weight handling equipment is temporarily configured as a crane for lift hook work. Wedge socket end connections shall not be used on weight handling equipment permanently configured (including boom length) as a crane for lift hook work. Wedge socket end connections shall not be used on wire rope installed on weight handling equipment designated for use in "special purpose service" in accordance with NAVSEA 0989-030-7000 Lifting Standard, or used for lifting and handling ammunition, hazardous, or explosive material as prescribed in NAVSEA OP5. The following special precautions shall be taken in the installation and use of wedge socket connections.

(1) Wedge sockets develop only 70 percent of the breaking strength of the wire rope due to crushing action of the wedge. Extreme caution shall be exercised when wedged socket connections are used in making rated capacity lifts.

(2) Wedge sockets are particularly subject to wear, faulty component fit, and damage from frequent changeouts, and are highly vulnerable to inadvertent wedge release and disassembly in two-blocking situations.

(3) Wire rope clips that clamp both the dead end and live rope shall not be used in conjunction with a wedge socket. Such connectors are hazardous in that they restrain the wedge from seating properly in the socket.

(4) Wedge sockets shall be installed in accordance with the following procedures.

(a) Because the section of the wire rope used in the prior socket has been subject to sharp bending and crushing, it shall be cut and removed prior to resocketing.

(b) Caution must be exercised in installing the wedge socket properly to ensure that the wire rope carrying the load is in direct alignment with eye of the socket clevis pin so the load pull is direct (see Figure 21-5).

(c) Place socket in upright position and bring the rope around in a large, easy to handle hoop. Extend the dead end of the wire rope from the socket for a distance of at least one rope lay length. Insert wedge in the socket permitting the rope to adjust around the wedge.

(d) Secure the socket to a support and carefully take a strain on the live side of the rope to ensure proper initial seating of wedge. Increase load gradually until wedge is fully seated. Avoid applying any sudden shock loads.

d. Other End Connections. The crane manufacturer's original design configuration for dead end connection devices at the hoist drums are acceptable as originally installed and for replacement. Crane manufacturer's original design configuration for dead end connections on the hoist block and/or frame of Category 3 hoists (air, electric, hydraulic) are acceptable as originally installed and for replacement.

21-21. Documentation Requirements. Each activity shall establish and maintain an individual equipment history record file on each unit of weight handling equipment. The equipment history record file shall contain the following

documentation which shall be retained for the time period indicated, as a minimum:

<u>Documentation</u>	<u>Retention (Minimum)</u>
(1) Maintenance Inspection Specification and Record	2 year and latest of each type
(2) Crane Operator's Daily Checklist	Current and previous month
(3) Shop Repair Orders or other repair documents	
(a) Load Bearing/Load Controlling Parts	7 years
(b) All others	1 year
(4) Nondestructive Test Reports	Latest (for component)
(5) Crane Condition Inspection Record and Extensions	Current and one previous record and extensions
(6) Certification of Load Test and Extensions	Current and one previous certification and extensions
(7) Wire Rope Minimum Breaking Strength Certification for replacement wire rope (manufacturers)	Latest
(8) Modifications and Alterations Approvals	Life of crane
(9) Crane Deficiency Reports (i.e., malfunction or failure of load bearing or load controlling parts)	7 years
(10) Other Documentation (i.e., purchase contracts, specifications, acceptance tests, etc.)	Optional
(11) Incident and Accident Reports	7 years
(12) Hook Tram Point Base Measurement	Life of hook

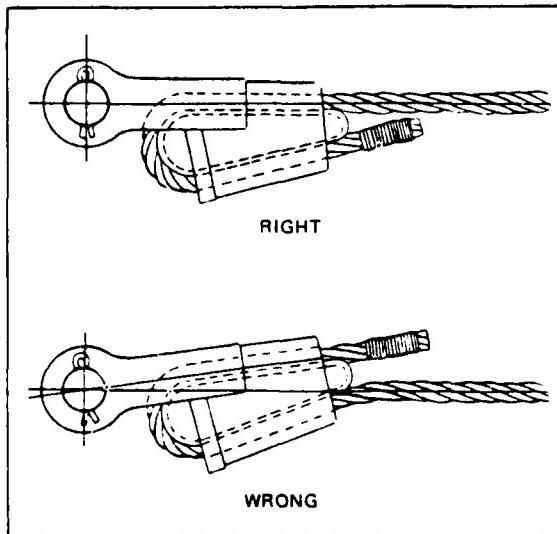


Figure 21-5
Wedge Socket End Fitting

21-22. Aerial Servicing Platform/Truck (Code 0725 and 5660) Maintenance, Inspection, and Load Testing.

a. Maintenance Requirements. Maintenance and lubrication shall be performed in accordance with manufacturer's recommendations for depth, detail, and frequency. If the manufacturer's maintenance or lubrication frequency is not available, the activity shall develop and implement its own maintenance and/or lubrication schedule.

b. Inspection and Test Frequency. Aerial servicing platform truck (Code 0725 and 5660) shall be inspected and tested in accordance with the following schedule.

(1) Daily. The operator shall perform a daily preoperational check as prescribed by the manufacturer in the technical manual provided with the equipment unit. The operator shall complete an Operator's Inspection Guide and Trouble Report, NAVFAC 9-11240/13, daily and forward it to his operations supervisor or dispatcher.

(2) Annual.

(a) Platform/Truck shall be given an annual condition inspection and load test in accordance with procedures set forth in paragraphs c., d.(1).., and e. following. In addition, the truck shall be certified by the responsible individual at the activity. A copy of the certification shall be posted in the cab of the truck. A locally developed condition inspection, load test, and certification format for this purpose shall be used.

(b) Electrical test on insulated devices per paragraph f. following.

(3) Repairs. A condition inspection and load test shall be performed after each major repair to a load bearing or load controlling part. The next annual condition inspection and load test shall be rescheduled accordingly.

c. Visual Inspection (Prior to Load Test). Prior to conducting all load tests, at least the following critical areas shall be visually inspected for deficiencies which would preclude safely conducting the prescribed load test:

- (1) Outriggers, spring lock outs, and attaching areas.
- (2) Turntable, base, trunnion, and yoke at attachment of lower boom and struts.
- (3) Lower boom at cylinder clevis brackets.
- (4) Lower boom sheaves, sheave supporting brackets, cable anchor, and supporting brackets.
- (5) Lower boom at attachment to upper boom.
- (6) Upper boom sheaves, sheave supporting brackets, cable anchor, and supporting brackets.

(7) Structure of upper and lower boom.

(8) Upper boom and yoke at attachment to basket(s) and side brackets.

d. Load Test (Stability and Range of Movement).

(1) The load test shall be conducted with the truck resting on approximately level ground, not fastened to any artificial base, and the outriggers in place. All tests shall be conducted using the ground level controls; at no time will personnel be permitted to ride on the platform (basket). The platform (basket) shall be loaded with an evenly distributed load equal to one and one half times the rated working load and exercised through the full range of horizontal and vertical positions to include at least the following:

(a) When the upper and lower arms are in a horizontal or in their most horizontal plane and extended to the maximum reach.

(b) When the lower arm is horizontal or near horizontal and to the side of the vehicle and the upper arm in the most vertical position possible.

(c) When the lower arm is at the maximum travel from the stowed position and the upper arm horizontal and 45 degrees to the side of the vehicle or over the four corners of the vehicle. Rotate the turntable clockwise and counterclockwise with the test load for two complete revolutions in each direction.

(2) All newly acquired used aerial service trucks shall be tested for stability per SAE J765a (Appendix M) and paragraph (3) following, in those cases where the manufacturer's related working load is not available or where the acquiring activity may suspect alteration/modification affecting stability may have previously been performed. The range of movement test in paragraph (1) preceding shall apply during the stability test.

(3) Stability test shall be conducted as follows:

(a) Stability on Level Ground. Each aerial servicing platform shall be capable of sustaining a static load, one and one half times its rated capacity, when vehicle is on a firm and level surface.

(b) Stability Test. The stability test as outlined in Crane Load Stability Test Code, SAE J765 (Appendix M) shall apply as modified to platform loading.

(c) Stability and Slopes. Each aerial servicing platform shall be capable of sustaining a static load, one and one third times the rated capacity in every position in which the load can be placed when the vehicle is on a slope of 5 degrees downward in the direction most likely to cause overturning. If use of outriggers is specified, then outriggers shall be extended to provide maximum leveling for the purpose of determining whether the unit meets the stability standard. If other facilities, such as a means of turn-table leveling, are provided to minimize the effect of sloping terrain, then

those facilities shall be utilized for the purpose of determining whether the unit meets the stability standard.

(d) Effects of Stability Test. None of the preceding tests shall produce instability (as defined herein) of the unit or cause permanent deformation of any component.

e. Visual and Nondestructive Inspection (Subsequent to Load Test). Subsequent to conducting all load tests, a visual inspection of at least the following critical areas for evidence of overstress shall be made:

- (1) Outriggers, spring lock outs, and attaching areas.
- (2) Turntable, base, trunnion, and yoke at attachment of lower boom and struts.
- (3) Lower boom at cylinder clevis brackets.
- (4) Lower boom sheaves, sheave supporting brackets, cable anchor, and supporting brackets.
- (5) Lower boom at attachment to upper boom.
- (6) Upper boom sheaves, sheave supporting brackets, cable anchor, and supporting brackets.
- (7) Structural steel of upper and lower boom.
- (8) Upper boom and yoke at attachment to basket(s) and side brackets.
- (9) All structural members and platform (baskets) leveling mechanisms.

Overstressed areas may be identified by deformation or cracking, loss of paint, and by the presence of hair line cracks. Welds in the boom, platform, turntable, and other areas showing evidence of overstress during visual inspection shall be nondestructively tested by the magnetic particle method (dye penetrant and radiograph for nonmagnetic materials) for defects.

f. Electrical Tests On Insulated Devices. Aerial servicing platform trucks that are used when working on energized high voltage electrical lines (hot work) or equivalent shall be electrically tested to the requirements of American National Standards Institute (ANSI) A92.2 (latest revision) annually. The electrical test shall be repeated when the electrical insulation portion of the aerial servicing platform truck has been altered. The electrical insulated portion of an aerial servicing platform truck shall not be altered in any manner that might reduce its electrical insulating properties. A copy of a certified report of the electrical test shall be posted in the cab of the truck.

21-23. Line-Handling Mechanisms (Capstans/Winches Used for Motive and Maneuvering Power Exclusive of Hand-Powered Mechanisms) Maintenance, Inspection, and Testing. Activities shall provide a program of maintenance, inspection, and testing to incorporate the following requirements as a minimum:

a. Operator Check. Prior to each use, the operator shall perform an inspection of the capstan or winch as follows.

(1) Inspect the capstan head (drum) for cracks, rough or sharp surfaces, and clearance around cover plates or decking.

(2) Visually check controls for damage.

(3) Inspect accessible parts of the capstan for wear, cracks, loose fasteners, and general condition.

(4) Include any specific inspection items prescribed by the equipment manufacturer.

(5) Operate the capstan or winch through all motions and check proper operation of control points, brakes, and drum or head clearance. Report any deficiencies found during inspection, or noises heard during operational check, to the cognizant shop responsible for repair and maintenance.

b. Preventive Maintenance. Annually, each line handling mechanism shall be given a preventive maintenance inspection as follows.

(1) Remove all covers, guards, and shields necessary to provide access to the foundation, capstan or winch, motors, brakes, and controls.

(2) Check motor and machinery foundations for soundness and drainage.

(3) Check for loose, missing, corroded, or cracked structural members; securing bolts, rods, nuts, rivets, etc.

(4) Inspect motor case and gearbox for cracks, corrosion, loose or missing fasteners.

(5) Inspect (where practical) for worn, defective, or misaligned bearings, couplings, bushings, shafts, pins, gears, and drums.

(6) Inspect to see if unit is lubricated as required by manufacturer and/or check lubricant levels as required.

(7) Inspect brakes for proper security of brake to foundation, lining thickness, condition of brake wheel, proper adjustment, and condition of wiring and electrical components.

(8) Inspect wire rope (where applicable) for broken wires, damaged strands, and excessive wear.

(9) Any additional inspections required by the manufacturer.

(10) Operate the line handling mechanism through all modes and observe proper functioning of motors, controls, brakes, and gears. Listen for unusual noises during operation.

c. Condition Inspection, Load Test, and Certification.

(1) Quadrennially, each line handling mechanism shall be given a thorough condition inspection consisting of the items in paragraph b. preceding and a load test. Each line handling mechanism shall be thoroughly inspected before, during, and after the load test.

(a) Load Test. Tests shall be conducted using dead load (test weights) or a dynamometer. When a dynamometer is used, the line handling mechanism shall be operated until a stall condition of the motor is evident. The line pull is then read on the dynamometer and recorded. Where weights are used, the actual weight shall be recorded. Test personnel should ensure that the brakes (where practical) operate correctly to hold maximum line pull obtained. Line pull obtained should be not less than 85 percent of the rated capacity. Manufacturer's rated speed need not be measured. The speed of the capstan should be observed during the tests to ensure that speed will be sufficient for the mechanism's intended purpose. Accuracy of test weights and dynamometer shall be ± 2 percent of recorded values.

(2) Upon satisfactory completion of the condition inspection and load test, the line handling mechanism shall be certified by a designated individual at the activity. Identification, certification date, and expiration date shall be placed on a tag or card and attached to the mechanism.

d. Lubrication and Servicing. Line handling mechanisms shall be lubricated and serviced in accordance with the manufacturer's instructions where available. Local instructions shall be provided when manufacturer's data are not available. Local experience and usage factors shall be considered when developing lubrication and servicing programs.

e. After Modifications or Repairs. An inspection and an operational test or load test, as appropriate, shall be performed to verify proper operation of the affected components.

f. Equipment History File. A file should be established for each equipment unit. Specifications, contracts, acceptance tests, complete description of the unit, lubrication and servicing plans; records of modifications, maintenance, and repair; and latest test and inspection records should be filed in the equipment history file.

CHAPTER 22. GUIDELINES FOR SELECTION
AND APPLICATION OF FUELS AND LUBRICANTS

22-1. General Selection and Application. The proper selection and application of fuels and lubricants are essential to the successful maintenance and operation of vehicles and equipment. It is the responsibility of transportation management to ensure that the correct fuels and lubricants recommended by the vehicle and equipment manufacturers, except as modified herein, are used and are correctly applied at the frequencies recommended as a minimum. Proposed deviations in fuel or lubricant products to be used, or reductions in frequency, shall be submitted to NAVFACENGCOM (Code 1202) via the appropriate EFD (TEMC).

22-2. Gasoline Engine Motor Fuel. It is Navy policy, pursuant to Title 40, Part 80, U.S. Code of Federal Regulations, to use unleaded (0.05 gm/gal) gasoline in 1975 and later year models of Navy-operated motor vehicles designed to operate on such fuel (passenger-carrying vehicles and trucks up to 6,000 lbs GVWR) within the 50 States.

22-3. Diesel Engine Motor Fuel. There are three grades of diesel fuel procured under Federal Specification VV-F-800 available in the supply systems. The following is a description and application data on these fuels.

Descriptive Data

FUEL OIL, DIESEL: Spec Fed VV-F-800B

Grade DF-A arctic; Military Symbol DF-A; 40 cetane min. Use: In high-speed automotive type diesel engines and in pot-type burner space heaters, in areas where mean ambient temperatures lower than minus 25°F occur, and where it is impractical to obtain or store diesel and burner fuels. This grade of diesel fuel should not be used for slow-speed stationary engine applications.

FUEL OIL, DIESEL: Spec Fed VV-F-800B

Grade DF-1, winter; Military Symbol DF-1, 40 cetane min. Use: In high-speed automotive service in areas in which ambient temperatures as low as -25°F occur. This grade of diesel fuel may be used for medium-speed stationary engine applications, where fuel heating facilities are not available.

FUEL OIL, DIESEL: Spec Fed VV-F-800B

Grade DF-2, regular; Military Symbol DF-2, 40 cetane min. Use: In all automotive high-speed diesel engines and in medium-speed engine applications in areas in which the ambient temperatures are above 20°F.

22-4. Gasoline Engine Lubricating Oil. Extensive field tests conducted jointly by NAVFACENGCOM and the U.S. Army Fuel and Lubricants Laboratory have resulted in a determination of the most suitable oils for use in spark-ignited internal combustion engines in Navy-operated equipment. The solution is a full-temperature range multiviscosity oil (SF type), which carries Specification MIL-L-46152B, entitled Lubricating Oil, Internal Combustion Engine, Administrative Service.

22-5. Diesel Engine Lubricating Oil. With the high-speed, high-output automotive diesel engines being used in vehicles and equipment, activities should use oils conforming to Specification MIL-L-2104C (CD Type).

22-6. Hydraulic Brake Fluids. Hydraulic brake systems are generally designed to use nonpetroleum-based heavy duty brake fluid. Caution shall be exercised to use only the brake fluid of the specification or type recommended by the manufacturer. A description of a hydraulic brake fluid maintained in the supply system follows.

Descriptive Data

HYDRAULIC FLUID NONPETROLEUM BASE.
AUTOMOTIVE: Spec VV-B-680B nonmineral oil; -40° to 131°F effective operating temperature. Use: Designed for automotive hydraulic brake systems.
Military Symbol HB. SAE J1703f

22-7. Automatic Transmission Fluids. There are two types of automatic transmission fluids recommended by vehicle and equipment manufacturers. The fluid designated TYPE "A" SUFFIX "A" is designed specifically for automatic transmissions used in motor vehicles. Manufacturers of some of the larger automatic transmissions used in construction equipment recommend the use of a heavy duty engine oil in a SAE 10W viscosity. These are known as Hydraulic Transmission Fluids Type C2. Generally, engine oils meeting Military Specifications MIL-L-2104C in the SAE 10 viscosity range are approved for use as a Type C2 transmission fluid.

22-8. Other Hydraulic Fluids. The hydraulic fluid specified by the manufacturer should be used in the equipment's hydraulic system. In certain cases, the manufacturer will specify the use of SAE 10 or 10W engine oil. In such cases, oils meeting Military Specification MIL-L-2104C in a SAE 10 or 10W can be used.

22-9. Grease, Multipurpose. Pending completion of tests being conducted by the U.S. Army Fuels and Lubricants Research Laboratory to establish a Military Specification for an improved multipurpose grease, activities are advised to use the best available commercial multipurpose grease for wheel bearings, chassis, and general lubrication.

22-10. Enclosed Gear Lubricant. Generally, all enclosed gears on vehicles and equipment can be satisfactorily lubricated with a multipurpose gear lubricant meeting Military Specification MIL-L-2105C .

22-11. Exposed Gear and Wire Rope Lubricant. Construction equipment has numerous open gear assemblies which must be lubricated and protected from corrosion. A lubricant used for this purpose cushions shock loads, reduces wear and noise, resists water washing, and prevents corrosion. Such a lubricant is designed to cling to gear teeth, wire rope, and other surfaces at high pressures, temperatures, and speeds. Exposed gear and wire rope lubricant conforming to Military Specification MIL-G-18458A meets these requirements .

22-13. Antifreeze. Antifreeze meeting Military Specification MIL-A-46153 will be used in water cooled engines. Technical requirements of MIL-A-46153A negates the changing of antifreeze after one year's use. Military Specification antifreeze inhibited solution may now be retained in engine cooling systems for an extended period of four (4) years from fill date, providing it is tested annually for alkalinity. A test kit, Reserve Alkalinity Antifreeze, NSN 6630-00-169-1506, is available and should be employed for this purpose.

22-14. Commercial Engine Oil Additives. The advertising media present announcements by manufacturers marketing oil additive products claimed to cure engine problems. In many cases, these products are only petroleum solvents which are less than totally effective in reducing certain high temperature deposits. Others are compounds of the additives already included in effective quantities in formulations of the approved quality engine oils specified for Navy use. In either case, the use of additive products are unnecessary at best and could be harmful to the engine. The formulation of engine oils with these many additive compounds is highly complex and is best left to the technical competence of the oil companies. It is therefore Navy policy to approve only the use of qualified oil in Navy vehicles and equipment, meeting the specifications set forth herein .

22-14. Commercial Fuel Additives. The advent of the national effort to achieve clean air has prompted a number of "after market" manufacturers to offer diesel and gasoline fuel additives which they claim will reduce engine exhaust emissions, reduce fuel consumption and maintenance, and generally improve engine performance. Tests of a representative sampling of such products by the U.S. Army Fuels and Lubricants Research Laboratory have shown that such additives are generally without merit. It is therefore the Navy policy to approve the use only of diesel and gasoline motor fuel meeting Federal or military specifications.

22-15. Special Lubricants. Where the manufacturer specifies a special lubricant that cannot be identified as having the same properties as standard specification lubricants, users shall obtain and use the manufacturer's recommended lubricant.

CHAPTER 23. WARRANTIES AND DEFICIENCIES

23-1. Warranties-General. Normally, warranties guarantee equipment, and parts thereof, procured by the Government against defective material and workmanship for the warranty period specified in the procurement contract. On equipment delivered for use within 50 States, the guarantee includes the furnishing (without cost to the Government, f.o.b. the manufacturer's nearest dealer or branch, or the original destination if desired by the Government) of new parts or assemblies to replace any that prove to be defective within the warranty period. In addition, when the Government elects to have the work performed by the contractor, the cost of labor involved in the replacement of the defective parts or assemblies at the contractor's plant, branch, or dealer facility shall be borne by the contractor. On equipment delivered for use outside the 50 States, the guarantee includes furnishing of new parts or assemblies to replace any returned to the contractor by the Government which prove to be defective; the replacement parts or assemblies to be delivered by the contractor to the port of embarkation in the U.S. designated by the Government. The contractor is not required to bear the cost of labor involved in correcting defects outside the 50 States unless it is so stipulated in the contract.

23-2. Warranty Period. Activities can obtain warranty information on Civil Engineering Support Equipment (CESE) from warranty decals or from the contract document. If activities encounter difficulty in finding or determining warranty provisions applicable to equipment received, the information can be obtained by contacting the cognizant EFD (TEMC).

23-3. New Equipment Inspection. Activities shall inspect all new CESE and make necessary adjustment before release for use. Such inspection shall be limited to normal predelivery service (such as is usually performed by a dealer) and other items necessary for safe, serviceable operation. Particular attention shall be given to the detection of deficiencies eligible for correction under warranty provisions of the contract.

23-4. Reporting Deficiencies Affecting Safety. All CESE (excluding non-USN numbered weight handling equipment) regardless of warranty coverage developing design deficiencies affecting their safe operation shall be immediately removed from service and reported by message to the Commanding Officer, Naval Construction Battalion Center (CBC), Port Hueneme, CA (Code 153), with copy to the cognizant EFD (TEMC) and NAVFACENGCOM (Code 1202), followed by a Quality Deficiency Report (Standard Form 368). No corrective action will be taken nor will equipment be returned to service until directed by CBC Port Hueneme. Message report shall contain the following information:

- (1) USN number
- (2) Type of equipment
- (3) Manufacturer
- (4) Model
- (5) Serial number

- (6) Year of manufacture
- (7) Contract number
- (8) Part number of part that failed
- (9) Part nomenclature
- (10) Description of failure (for example; fracture, crack, bent, or corroded)
- (11) If failure resulted in accident, briefly describe
- (12) Proposed corrective action (optional)

23-5. Deficiency Correction Under Warranty. As soon as it is determined that a deficiency exists during the warranty period, the activity shall initiate the following corrective action (see paragraph 23-9 for exception regarding technical documentation):

a. All CESE (U.S. Only). Activities located in the U.S. shall contact the local franchised dealer, when available, for warranty deficiency correction. If a local dealer is not available, is not responsive, or corrective action is unsatisfactory, the problem shall be referred to either the factory branch, the manufacturer's district representative, or the manufacturer. When these sources are unsatisfactory, the problem shall be referred to the cognizant EFD (TEMC) for continuing action to obtain resolution. Activities experiencing a warranty deficiency shall complete a SF 368 with distribution in accordance with paragraph 23-8 (see Figure 23-1).

b. All CESE (Outside U.S.). Replacement of defective parts shall be requested directly from the prime contractor's main office unless otherwise specified in the contract. Poor workmanship or design that affects the operation of the equipment shall be reported utilizing the SF 368 with distribution in accordance with paragraph 23-8. At the request of the EFD (TEMC), CBC Port Hueneme (Code 153) shall take continuing warranty corrective action with the prime contractor and, if necessary, the contracting officer.

c. In-house Repairs to Equipment Under Warranty (U.S. Only). Activities having shop facilities shall correct minor warranty deficiencies in house when the total cost to the Government to transport the equipment to and from the dealer exceeds the total cost of the warranty claim, or when the delay in obtaining warranty service through the dealer will result in unacceptable downtime. Activities performing in-house repairs to equipment to reduce cost or downtime cannot submit a claim against the manufacturer unless specific authorization has been received.

23-6. Technical Assistance. The EFD's (TEMC's) shall provide technical assistance to activities by developing points of contact and procedures for resolving specific problems connected with reporting and correcting warranty

**QUALITY DEFICIENCY REPORT
(Category II)**

SECTION I

1a. From (Originating point) Naval Station Mayport, FL 32228		2a. To (Screening point)	
1b. Typed Name, Duty Phone and Signature P. Cianciola 960-5222		2b. Typed Name, Duty Phone and Signature	
3. Report Control No.	4. Date Deficiency Discovered 3-16-75	5. National Stock No. (NSN)	6. Nomenclature Hub and Drum Assembly
7. Manufacturer/Mfg. Code/Shipper Oshkosh	8. Mfg. Part No. FF50206	9. Serial/Lot/Batch No. N/A	10. Contract/PO/Document No. N62465-68-C-0101
11. Item <input checked="" type="checkbox"/> New <input type="checkbox"/> Repaired/ Overhauled	12. Date Manufactured/ Repaired/Overhauled 1-1-75	13. Operating Time at Failure 80 Hours	14. Government Furnished Material <input type="checkbox"/> Yes <input type="checkbox"/> No
15. Quantity	a. Received	b. Inspected	c. Deficient
16. Deficient Item Works On/With	a. End Item (Aircraft, tank, ship, howitzer, etc.) b. Next Higher Assembly	(1) Type/Model/Series MB-5 Firefighting Aircraft Rescue Truck A-1111 (1) National Stock No. (NSN) N/A	(2) Serial No. 00000 (3) Part No. 79698 (4) Serial No./Lot No. Model No. 9321-1
17. Dollar Value	18. Est. Correction Cost	19. Item Under Warranty <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	20. Work Unit Code/EIC (Navy and Air Force only)
21. Action/Disposition <input type="checkbox"/> Holding Exhibit for _____ days <input type="checkbox"/> Released for Investigation <input type="checkbox"/> Returned to Stock/ Disposed of <input type="checkbox"/> Repaired <input type="checkbox"/> Other (Explain in Item 22)			

22. Details (Describe, to best ability, what is wrong, how and why, circumstances prior to difficulty, description of difficulty, cause, action taken including disposition, recommendations. Identify with related item number. Include and list supporting documents. Continue on separate sheet if necessary.)

The right rear axle flange studs (16) came loose causing the studs to shear off and leaving the stud holes egg shaped.

Inspection of the damaged parts revealed that the boss of the hub lacked sufficient strength to withstand the heavy service required of the truck.

The manufacturer was advised of our findings and both rear hub and drum assemblies have been replaced with a heavier type.

SECTION II

23a. To (Action Point)	24a. To (Support Point) (Use Items 25 and 26 if more than one)
23b. Typed Name, Duty Phone and Signature	24b. Typed Name, Duty Phone and Signature
25a. To (Support Point)	26a. To (Support Point)
25b. Typed Name, Duty Phone and Signature	26b. Typed Name, Duty Phone and Signature

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STANDARD FORM 368, April 1974
General Services Administration (FPMR 101-26-7)

**Figure 23-1
Quality Deficiency Report**

Carbon paper is required — only face of form is chemical treated

SECTION III

STANDARD FORM 368 BACK
April 1974

Figure 23-1 (continued)
Quality Deficiency Report

INSTRUCTIONS FOR PREPARATION OF SF368 FOR MOTOR VEHICLES

General. The following are the only items on SF 368 to be completed when the deficiency involves motor vehicles or components thereof, including tires, tubes and batteries.

Item 1a. From (Originating point). Enter the address of the originating point.

Item 1b. Type name, duty phone, and signature. Enter the date, name, commercial phone number (include area code), and signature of an individual who will serve as a contact for questions regarding the report and/or to request a sample/exhibit.

Item 4. Date Deficiency Discovered. Enter the date the deficiency was discovered or in the case of automotive vehicles, the earliest date deficiency was suspected.

Item 6. Nomenclature. Enter the name of the material or component part of an item, show nomenclature of part (e.g., carburetor), and show end item information in item 16a(1) and (2).

Item 7. Manufacturer/Mfg. Code/Shipper. Enter the name of the manufacturer, maintenance contractor, or Government activity which has repaired or overhauled the deficient material, as applicable. When the shipper is different from the manufacturer, also include the shipper's name. (For motor vehicles, enter manufacturer of vehicle or component part, as applicable.)

Item 8. Manufacturing Part No.

Item 9. Serial/Lot/Batch No. As applicable, enter the manufacturer's serial number, lot number, or batch number of the deficient material.

Item 10. Contract/PO/Document No. Enter the number of the contract (GS-005-_____), purchase order, and requisition, or item number from the purchase order. (For motor vehicles, these numbers appear on GSA Form 1398, GSA Purchased Vehicle, affixed to the vehicle and/or the purchase order.)

Item 11. Item. Check the appropriate block to indicate whether the material is either new or repaired/overhauled.

Item 12. Date Manufactured/Repaired/Overhauled. Enter appropriate date. If the material is repaired or overhauled, enter the last repair/overhaul date and miles or hours at time of repair.

Item 13. Operating Time at Failure. Indicate the time material had been in operation since new or overhaul/repair-when the deficiency was discovered, using the appropriate performance element; e.g., odometer miles, hour meter hours, etc. If the item is a motor vehicle also indicate the date the vehicle was placed in service.

Item 15d. In Stock. Enter the number of items in stock, as applicable. For motor vehicles, enter number on hand of same type, year, and model (in terms of engine, transmission, etc.).

Item 16. Deficient Item Works On/With. When deficient item is a component part of equipment, motor vehicle, etc., include pertinent data on end item. (On motor vehicles, enter model, year, and serial number; e.g., Nova, 1970, LS33F100001.)

Item 19. Item Under Warranty. Check one of the blocks to indicate whether the deficient item is covered by a contractual warranty, if known.

Item 21. Action/Disposition. Check one of the blocks to indicate the action taken or requested concerning the deficient material. If an exhibit is being held, indicate the number of days the exhibit will be held by completing the space provided (Holding Exhibit for _____ Days). If none of the items indicate the action/disposition taken or requested, check "other" and identify the nature of the action taken or requested in item 2.

Item 22. Details. For a fully comprehensive report, the following types of information should be entered in this item if applicable and available:

- a. An explanation of what is wrong with the item (e.g., right rear brake drum cracked, oil pan leak at front seal, frame broken at RR spring hanger). Explain how the item does not function with relating parts or assemblies, describing cause, if known. Include specific violations of specifications, pertinent regulations, instruction and/or contracts. If an exhibit is being held, give the location.
- b. How the deficiency was detected or confirmed; e.g., visual inspection, functional operation, during use.
- c. Include the number of previous known deficiencies concerning these items and show date of report and report number where motor vehicles are involved (e.g., 7/7/76, #4-76; 9/7/75, #5-76, etc.).
- d. Where the deficiency condition was discovered; i.e., receipt inspection, during cyclical inspection, during maintenance, special inspection directed by inventory control point, or, in the case of motor vehicles, provide name of Government or commercial shop which discovered deficiency.

Figure 23-1 (continued)
Quality Deficiency Report

- e. Include storage or handling information when it appears that these factors have contributed to the deficiency being reported.
- f. List the supporting documents included with this report. Photographs or sketches are extremely valuable and should be included whenever possible. (When photographs are taken, a 12-inch or other ruler should be employed as a scale placed beside the object in each photograph. Measurements should also be shown on sketches.)
- g. Include the following information when motor vehicles or components thereof are involved:
 - (1) Name and address of agency or activity that contracted for purchase of vehicle.
 - (2) Date vehicle received.
 - (3) Odometer or hours on vehicle and date when delivered to first consignee.
 - (4) Delivery FOB Origin or FOB Destination.
 - (5) Name of delivering carrier.
 - (6) Name and address of repair facility (dealer, commercial garage, or Government facility).
 - (7) Repaired under warranty at no cost or at Government expense.
 - (8) Cost of parts, labor, and total if paid for by Government.
 - (9) If correction refused, give name and address of contact at both dealer and/or manufacturer's zone or service office.

Figure 23-1 (continued)
Quality Deficiency Report

deficiencies in CESE. Activities, EFD's, and TEMC's shall not communicate directly with the contracting officer. All communications dealing with warranty deficiencies which cannot be resolved by the activity or EFD (TEMC) and require action by the contracting officer shall be directed to CBC Port Hueneme (Code 153).

23-7. Coordinating Responsibility. CBC Port Hueneme, CA (Code 153), shall have the following responsibilities regarding warranty deficiencies:

a. Continuing action with the contractor or contracting officer when the field activity or EFD (TEMC) is unable to obtain a satisfactory warranty deficiency settlement with the contractor.

b. Analyzing deficiencies to determine if any modifications to the specification are required to prevent recurrence of the deficiency.

23-8. Preparation and Distribution of Quality Deficiency Report (Standard Form 368). Activities noting deficiencies within the warranty period shall complete and forward SF 368 in accordance with the sample in Figure 23-1 and the following procedures (see paragraph 23.9 for exception regarding technical documentation).

a. Section 1 is to be completed by the activity providing available information in the appropriate spaces. The EFD (TEMC) shall ensure that applicable items not completed by the activity are completed to the maximum extent possible. Applicable spaces to be completed are: 1a, 1b, 2a, 3, 4, 6, 7, 8, 10, 11, 12, 13, 15, 15b, 15c, 16a(1) and (2), 16b(2) and (3), 17, 18, 19, 20, 21 (as applicable), and 22.

b. Distribution. The originating activity shall date and assign a serial number to each deficiency report and route the report as follows:

- (1) Original to appropriate EFD (TEMC).
- (2) Copy to CBC Port Hueneme (Code 153).
- (3) Copy to NAVFACENGCOM (Code 1202).

23.9. Technical Documentation. In those cases where technical manuals (operators, repair, or parts) are not received with the equipment or are incomplete or incorrect, the receiving activity shall, within 10 days, complete and forward a SF 368. The report shall be forwarded to CBC Port Hueneme (Code 153). A copy of this report shall be forwarded to the cognizant EFD (TEMC) and NAVFACENGCOM (Code 1202).

23.10. Letter Deficiency Reports. If the SF 368 is not immediately available, the deficiency shall be reported by letter furnishing the following details:

- (1) Item description
- (2) Part or stock number
- (3) USN registration number

- (4) Model
- (5) Type
- (6) Manufacturer
- (7) Contract and item number
- (8) Date delivered
- (9) Received from
- (10) Date of initial trouble
- (11) Total miles/hours of operation before failure
- (12) Quantity of like items on hand
- (13) Description of deficiency. It is important that the deficiency be described in detail. Defective parts are not to be forwarded but are to be held for disposition instructions.
- (14) Degree and frequency of each deficiency
- (15) Probable cause
- (16) Recommendations
- (17) Remedial action taken
- (18) Warranty action taken

OVERSEAS ACTIVITIES

- (19) Location of the manufacturer's parts depot to which the part is being returned.
- (20) Shipping and marking instructions to be attached to the replacement part.

23-11. Status of Action Report. It is important that the SF 368 or letter report state if corrective action has been requested and the status of action. This status shall indicate names of dealers, factory branch offices or manufacturers contacted, and action resulting from such contacts. If the same deficiency is found on several units of similar equipment, only one report shall be submitted, referencing each of the several units involved. Similarly, if several deficiencies are found on one unit of equipment, only one report shall be submitted. Submit an additional report, referencing the previous report(s), if a deficiency recurs on a previously repaired or replaced part. In addition, SF 368 on deficiencies which were not satisfactorily corrected on equipment within a warranty period shall contain, in addition to the required information, the name and address of the manufacturer's representative refusing to comply with the terms of the warranty and reasons for refusal.

CHAPTER 24. ALTERATIONS AND MODIFICATIONS

24-1. Transportation Equipment (CESE) Except Weight Handling Equipment. All modifications to USN-Numbered Civil Engineering Support Equipment (CESE) that affect the safety, stability, operating characteristics, or so alter the original design configuration so as to change the basic function of the equipment in terms of end use performance or capacity, shall be approved in writing by the cognizant EFD. Requests for modification shall contain full justification and be accompanied by a detailed description and engineering calculations and drawings where appropriate. The EFD shall either approve or disapprove the request in writing. However, for any design change to equipment that affects the safe operating characteristics or warranty, the EFD shall obtain the approval of the manufacturer (contractor). Upon receipt of approval, activities shall file a copy of the approval in the equipment history record together with the record copy of the SRO used in accomplishing the approved alteration or modification. Where the alteration or modification affects the end use or capacity of the equipment so as to change its equipment code identification, the EFD shall take the necessary action to correct the master equipment inventory records.

24-2. Weight Handling Equipment (Except Naval Shipyards). All alterations and modifications to load bearing, load controlling, or safety devices to weight handling equipment described in Appendix I shall be approved by the cognizant EFD. Proposals shall be fully developed by the activity engineering organization. Where practical, concurrence/approval shall be obtained from the crane or crane component manufacturer. Requests for approval forwarded to the EFD shall fully describe the proposed alteration/modification and shall be accomplished as appropriate by specifications, design computations, drawings, and bills of material. Full documentation of EFD approval and installation and certification actions shall be filed in the crane equipment history record (see paragraph 21-21) and engineering drawings properly annotated.

a. Special Definitions/Exceptions. For purposes of clarification to paragraph 24-2 preceding, the following special definitions/exceptions apply.

(1) Definitions.

(a) Alterations/Modifications. Alteration or modification constitutes any change in the original manufacturer's design configuration. These are: (1) replacement of weight handling equipment parts and components with parts or components not identical with original (i.e., changes in material, dimensions, or design configuration); (2) the addition of parts or components not previously a part of the equipment; (3) the removal of components which were previously part of the weight handling equipment; and (4) rearrangement of original parts or components.

(b) Load Bearing Parts. Those parts of the weight handling equipment which support the load and upon failure or malfunction could cause dropping, uncontrolled shifting, or movement of the load or the machine.

(c) Load Controlling Parts. Those parts of the weight handling equipment which position, restrain, or control the movement of the load or machine, a failure or malfunction of which could cause dropping, uncontrolled shifting, or movement of the load or the machine.

(d) Safety Devices. Those parts, components, devices, or instruments that are essential to assist, alert, or warn the operator in the safe operation of the crane.

(2) Exceptions. Use of replacement parts or components under the following conditions does not constitute an alteration/modification of the subject equipment.

(a) Original and replacement parts/components that are identified as meeting the following criteria are considered identical.

(i) General Interchangeability. Any replacement part identified by the original manufacturer's part number to a single National Stock Number (NSN) in the current Defense Supply Agency (DSA) publication entitled Master Cross Reference List (MCRL); C-RL-1 (Manufacturer Number to NSN) and C-RL-2 (NSN to Manufacturer Number), is approved as interchangeable with any other manufacturer's part number listed under the same NSN.

(ii) Parts Common and Standard Hardware. Certain common parts and standard hardware and accessories are procured under Federal and military specifications. These are identified under NSN and normally stocked in the Navy supply system under these NSN's. Original parts identified to NSN's are approved for replacement by part identified under the same NSN.

(b) Where original crane or component manufacturer has issued a technical or parts change bulletin approving the use of a specific superseding part or component number in lieu of the original.

(c) When the activity holds original crane or component manufacturer's drawings, specifications, and bills of material, the activity may fabricate the part or have part fabricated to these drawings and specifications.

(d) Where activity contracts with original crane manufacturer or component manufacturer for repair, overhaul, or remanufacture.

24-3. Weight Handling Equipment at Naval Shipyards. Alterations and modifications of weight handling equipment described in Appendix I shall be defined and processed for approval in accordance with the procedures prescribed in NAVSEAINST 11200.2. See paragraph 24-4 regarding alterations to manufacturer's capacity ratings.

24-4. Alterations to Manufacturer's Rated Capacity of Weight Handling Equipment. Any proposed change to the weight handling equipment manufacturer's published or posted rated load capacity, including reductions in such rating due to deterioration or deficiencies of load bearing or load controlling components or safety devices of the machine, constitutes an alteration/modification. These shall be approved by the cognizant EFD in accordance with procedure prescribed in paragraphs 24-2 and 24-3 preceding. Local determination may be made to reduce the working capacity of weight handling equipment due to adverse operating conditions, such as limits in foundations, trackage or soil conditions, or other operational hazards such as operating mobile cranes on barges (see paragraph 5b of Appendix L).

24-5. Damaged Crane Booms. All lattice boom cranes with structural damage to the main chords of the boom shall be immediately removed from service. Lattice booms of the newer truck, cruiser, and crawler cranes are manufactured of lightweight, thin wall, high strength alloy tubular structural members. When the main chord of these tubular boom sections are damaged in any manner, including slight dents, they are severely weakened and have failed at loads significantly below rated capacities. All structural repairs to damaged booms shall be approved by the crane manufacturer and performed in accordance with specifications and procedures prescribed by the crane manufacturer. These are normally provided by the crane manufacturer in their technical repair manual provided with the crane. Following all repairs to a boom, the work shall be inspected and the crane load tested and recertified in accordance with paragraph 21-12.

CHAPTER 25. PAINTING, IDENTIFICATION MARKINGS, AND PROTECTIVE COATINGS

25-1. Repainting Requirements. Transportation equipment shall be repainted when inadequate protection is afforded against rust or corrosion. Equipment shall not be repainted merely to change the color or gloss characteristics if the finish is serviceable. Spot painting, in lieu of refinishing previously painted sections, should be done whenever practicable. Bare surfaces of sections of bodies and sheet metal, exposed by deterioration of paint, or by accidents, shall be spot painted immediately to prevent deterioration of the metal.

25-2. Painting Standards and Authorized Colors. All Navy transportation equipment shall be treated and painted in accordance with Specification MIL-T-704G, using paint specification FED TT-E-1593B (MR) with primer meeting specification FED TT-P-1757. The colors of the paint shall match the color chips in Federal Standard No. 595A unless otherwise specified and in accordance with colors listed in Table 25-1.

25-3. Painting of Recruiting Vehicles. The color and marking of recruiting vehicles shall be as prescribed by the Chief, Bureau of Personnel, and as approved by CNO.

25-4. Identification Markings.

a. Application and Location of Registration Numbers. The placement of registration numbers and other requirements for the marking of administrative use motor vehicles for purpose of identification as required by law are described in this chapter. The registration numbers on other equipment are to be applied on the exterior where there are suitable surfaces. Registration numbers are also to be applied or stamped on a nonrusting metal plate and permanently affixed to the interior of the vehicle. The size of the letters and numerals shall conform to the sizes shown in Figure 25-1. Location where possible shall be as shown in Figure 25-2. Where small surfaces are unsuitable for sizes shown in Figure 25-2, the size may be varied to suit the space. In general, the registration number shall be applied to the rear and sides of equipment. Markings may be painted or applied with nonreflectorized pressure elastometric film at the option of the activity, as follows.

b. Marking Materials. Markings shall be applied using one of the following.

(1) Paint. Use gloss enamel.

(2) Decal. (Nonreflectorized). Use pressure sensitive elastometric film conforming to Military Specification MIL-M-43719A.

(3) Decal. (Reflectorized). Use reflectorized pressure sensitive film conforming to Federal Specification L-S-300-1

c. Marking Colors. Painted and elastometric film color numbers shall conform to Federal Standard No. 595A. Reflective colors shall conform to Federal Specification L-S-300-1. Marking colors shall be as follows.

Table 25-1
Vehicle and Equipment Colors and Markings

Vehicle and Equipment Type	Equip Codes	Equipment Color and Chip No.	Markings Color	Special Colors and/or Markings
Sedan and Station Wagons	All	White 17886	Blue	See Note (6)
Buses	0060-0071	White 17886	Blue	See Note (1)(6)
Buses, School	0063	Yellow 13432	Black 17038	
Ambulance Light	0205, 0297, 0299	White 17875	Orange Dupont 31L	See para 25-14 and 25-15
Ambulance Conv	0314, 0333	White 17875	Orange Dupont 31L	See para 25-14 and 25-15
Ambulance Field	0306, 0331, 0332	White 17875	Black 17038	See para 25-14 and 25-15
Trucks, General Purpose	All	White 17886	Blue	See Note (5)(6)
Trailers, aluminum	All	Unpainted	Black 17038	See Note (5)
Trailers, steel	All	White 17886	Blue	See Note (5)(6)
Motorcycles, Scooters and Bicycles	0902, 0903 0905	Yellow 13538	Black 17038	See Note (1)
Construction and Allied Equipment	2110-5940	Yellow 13538	Black 17038	See Notes (1)(2)
Railway Cars	6100-6160, 6400	Aluminum*	Black 17038	See Notes (2)(3)
Railway Miscellaneous	6210, 6310, 6700 6220, 6311, 6701 6230, 6320, 6702 6240, 6370, 6800 6250, 6600	Yellow 13538	Black 17038	See Note (2)
Railway Caboose	6340	Red 11105	Black 17038	See Note (2)
Railway Locomotives	6520-6580	Yellow 13538	Black 17038	See Note (2)
Truck, Fire, Structural	7100-7225	Yellow 13538	Black 17038	See Note (4)
Trucks, Crash, Rescue, and other Fire-fighting Vehicles Used in Aircraft Operations	7250-7501	Yellow 13538	Black 17038	See Notes (1)(4)
Weight Handling Equipment	8120-8700	Yellow 13538	Black 17038	See Notes (1)(2)

*2 lbs aluminum pigment spec. TT-P-32. Type 11 Class B, 1 gal spar varnish MIL-V-1174.

Note (1): Black and yellow diagonal reflectorized warning stripes shall be installed on the front and rear of buses. Other items of transportation equipment operating in congested industrial areas or constitute a traffic hazard shall also be so striped. This shall include construction, weight handling, railway, vehicles and equipment used exclusively for servicing aircraft on runways, taxiways, landing strips, etc. Counterweights and boom tips on weight handling equipment shall be marked with black and yellow diagonal reflectorized warning stripes.

(Footnotes from Table 25-1 continued on next page)

(1) On vehicles or equipment painted yellow, use numerals and letters in gloss black, No. 17038.

(2) On vehicles painted white, individual letters and numbers shall be of the reflective type conforming to QPL-L-S-300-1, Type 1, Class 1, Reflectivity 1, Blue, "Scotchlite #3275" product number 9, 3M Company, St Paul, MN, 55101

25-5. Special Markings for Aircraft Refueling and Servicing Vehicles.

Special markings are required on fuel and oil servicing trucks and trailers to minimize the possibility of replenishing aircraft fuel or oil systems with an improper grade of fuel or oil. Precautionary markings are also required to provide sufficient warnings on these vehicles.

a. Flammable. Apply the word "FLAMMABLE" using 6-inch red reflective letters on a white background on the front, rear, and each side of the vehicle tank/semitrailer. The front marking may be omitted if space does not permit.

b. No Smoking Within 50 Feet. Apply the words "NO SMOKING WITHIN 50 FEET" using 6-inch red reflective letters on a white background on each side of the vehicle tank/semitrailer.

c. Product Identification. Tanks shall be identified with product designations for product being transported. Place the word "AVGAS," "JET FUEL," "AVLUBE," "DIESEL FUEL," "MOGAS," whichever is applicable, on the rear and both sides of the tank. All lettering will be no less than 6-inch red reflective letters imposed on a white background. Product designation markings shall be as follows.

(Continuation of table footnotes from previous page)

Note (2): Black is authorized for the chassis or understructure of all vehicles and equipment.

Note (3): Exterior black with white lettering is authorized for car railway, dump, hopper, side and bottom dump.

Note (4): Interior light green (No. 24525 semigloss enamel) will be mandatory for these types of vehicles and equipment.

Note (5): All vehicles and equipment used exclusively on aircraft landing areas shall be painted yellow No. 13538.

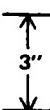
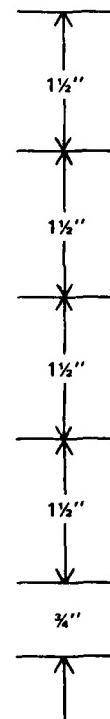
Note (6): Markings on vehicles painted white shall be reflective color (blue). See para 25-4,c.

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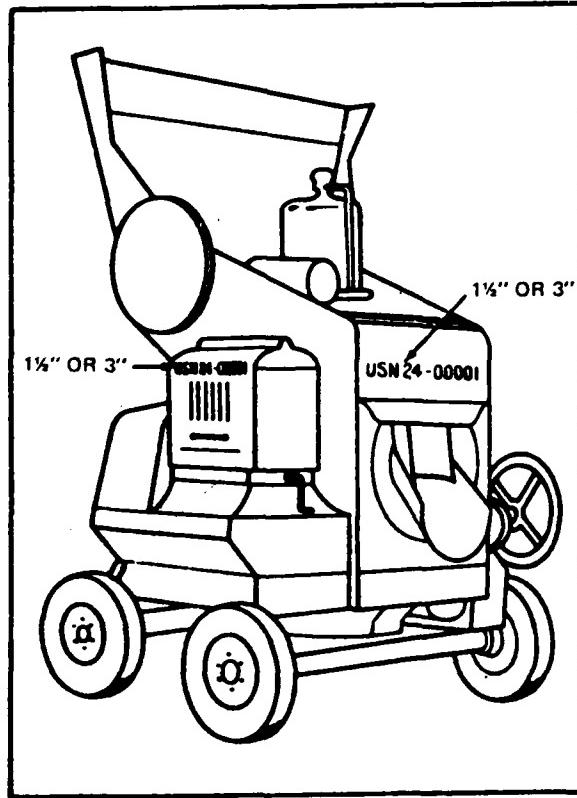
SIZE OF LETTERING AND NUMERALS, ADMINISTRATIVE MOTOR VEHICLES



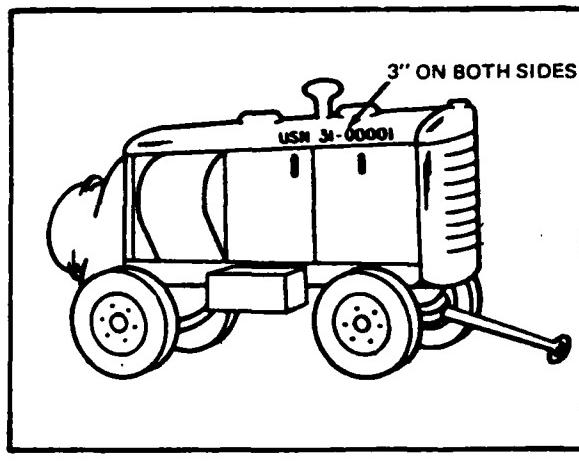
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SIZE OF LETTERING AND NUMERALS, CONSTRUCTION AND MOBILE EQUIPMENT

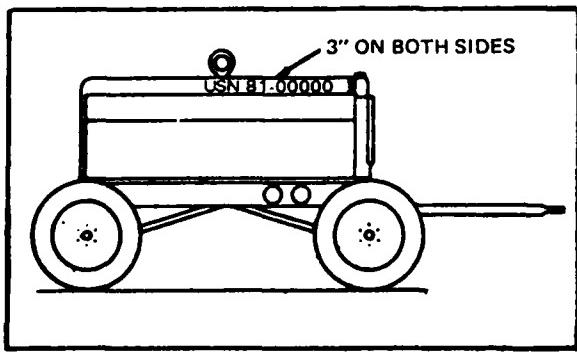
**Figure 25-1
Sizes of Lettering and Numerals**



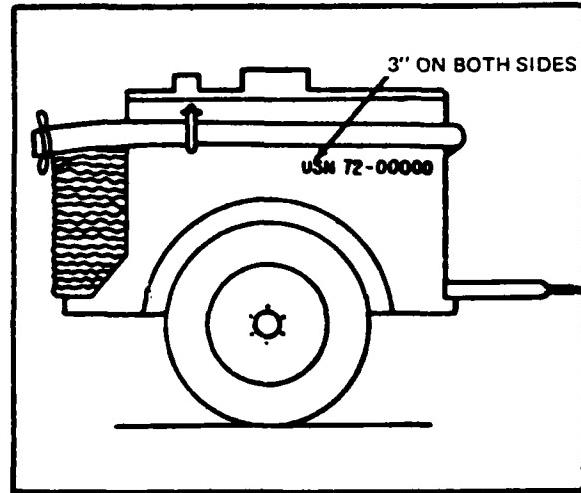
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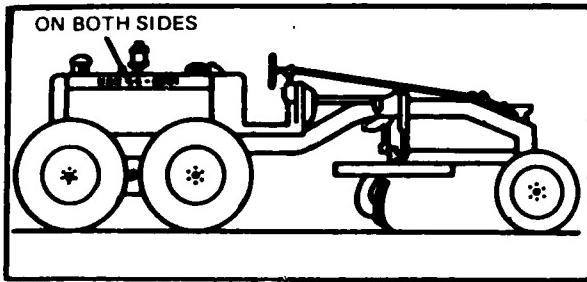


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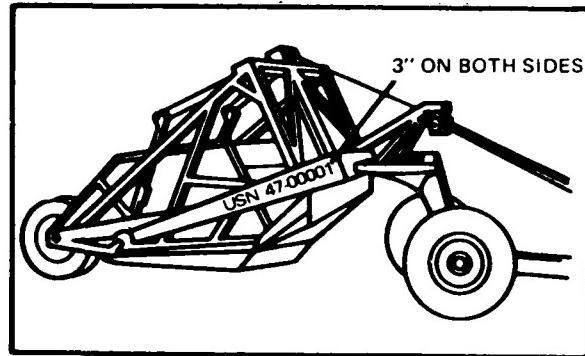


(4)

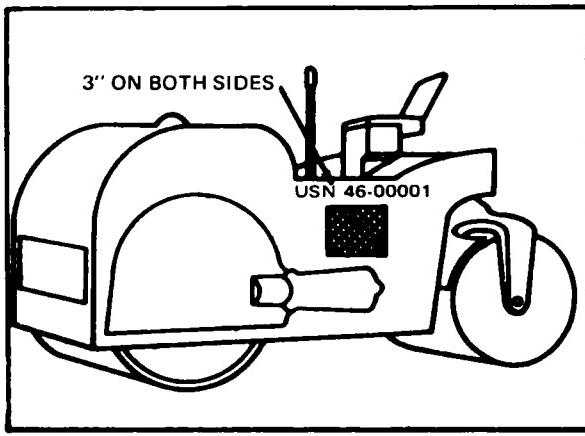
Figure 25-2
Sizes and Locations of Markings



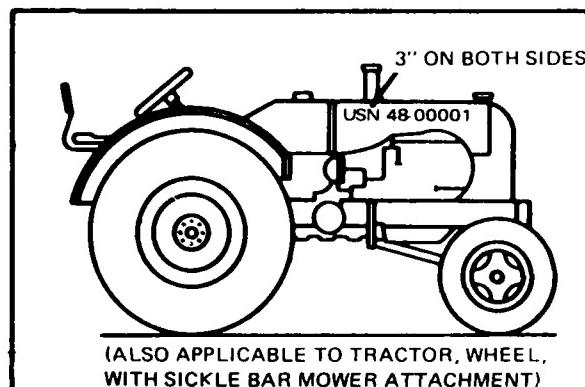
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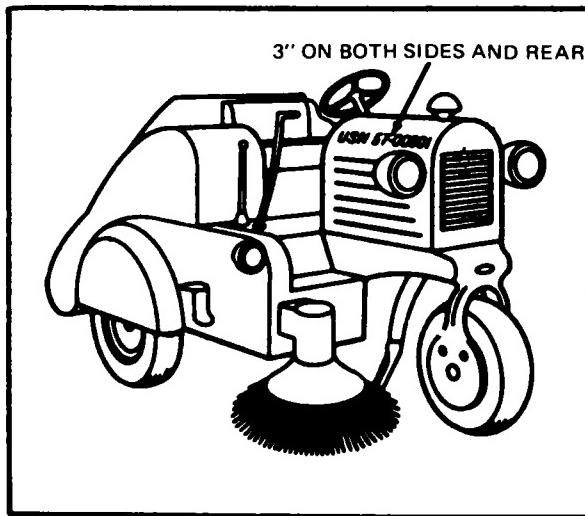
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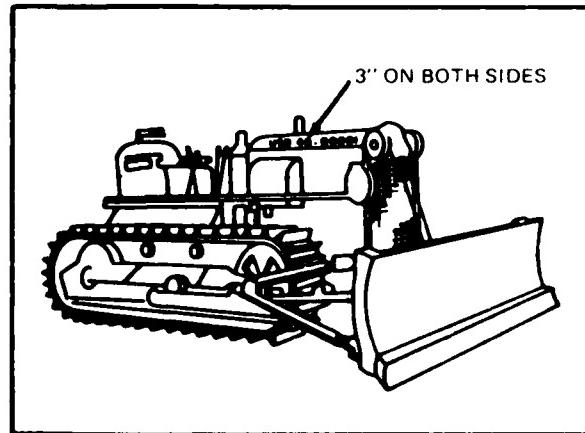
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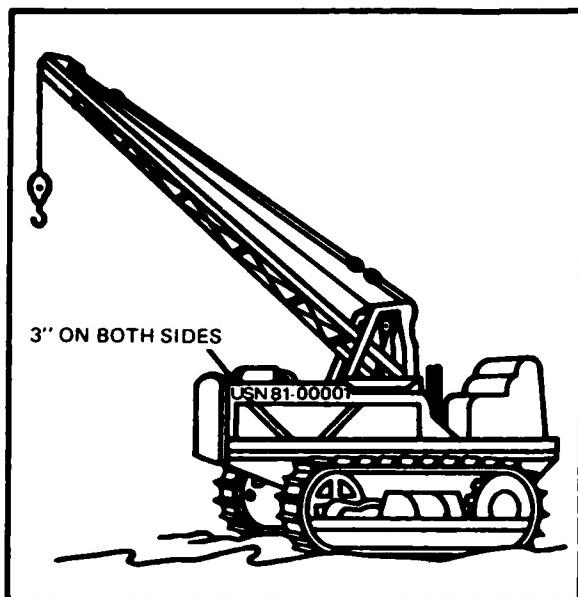


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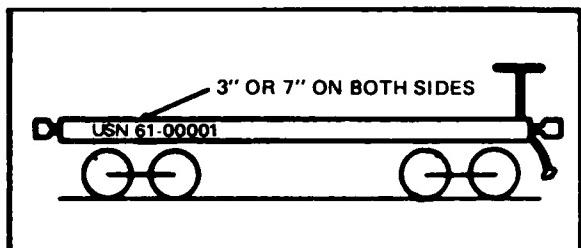


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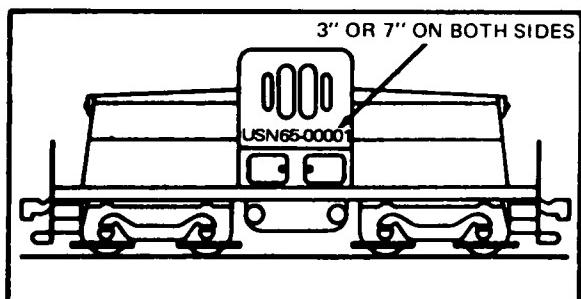
Figure 25-2 (continued)
Sizes and Locations of Markings



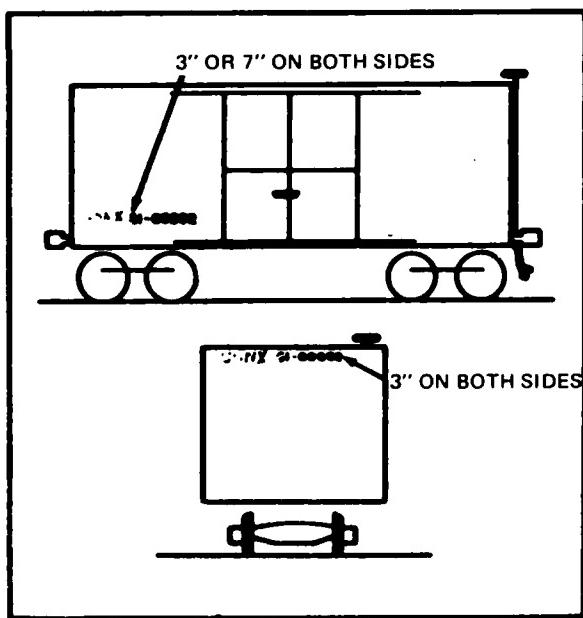
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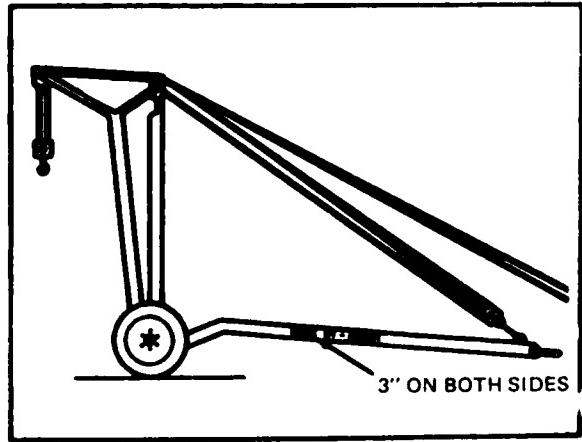
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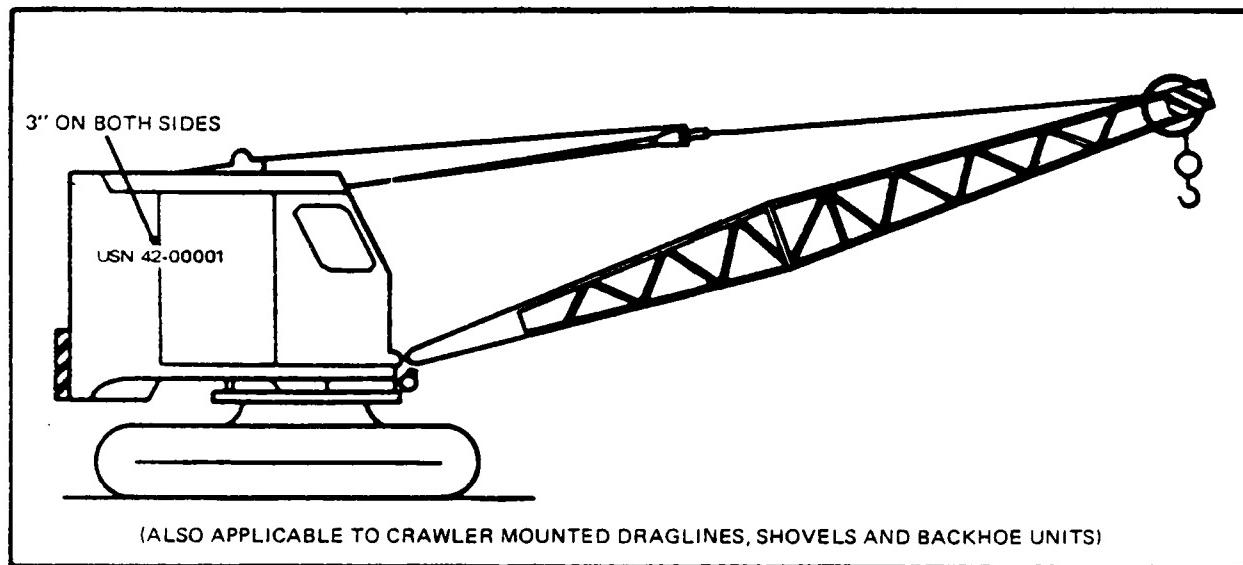


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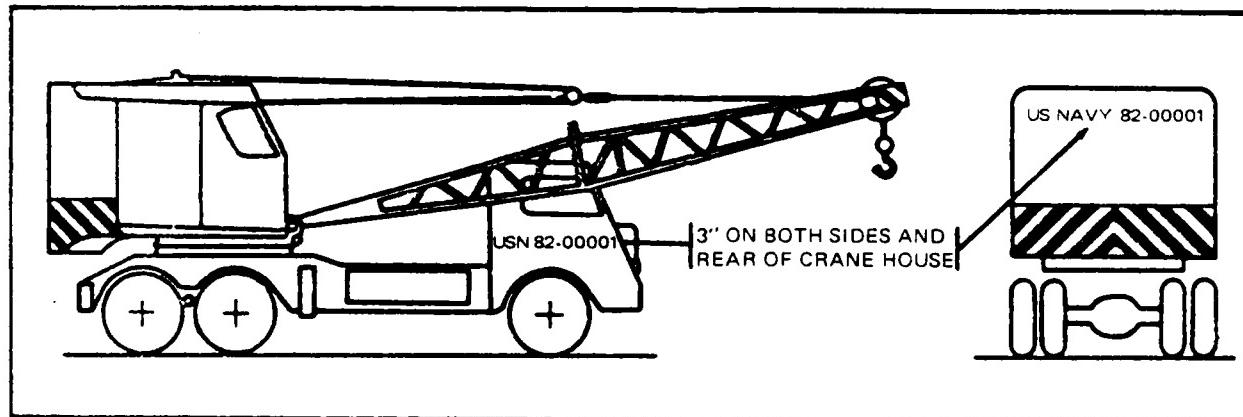


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Figure 25-2 (continued)
Sizes and Locations of Markings



(16)



(17)

Figure 25-2 (continued)
Sizes and Locations of Markings

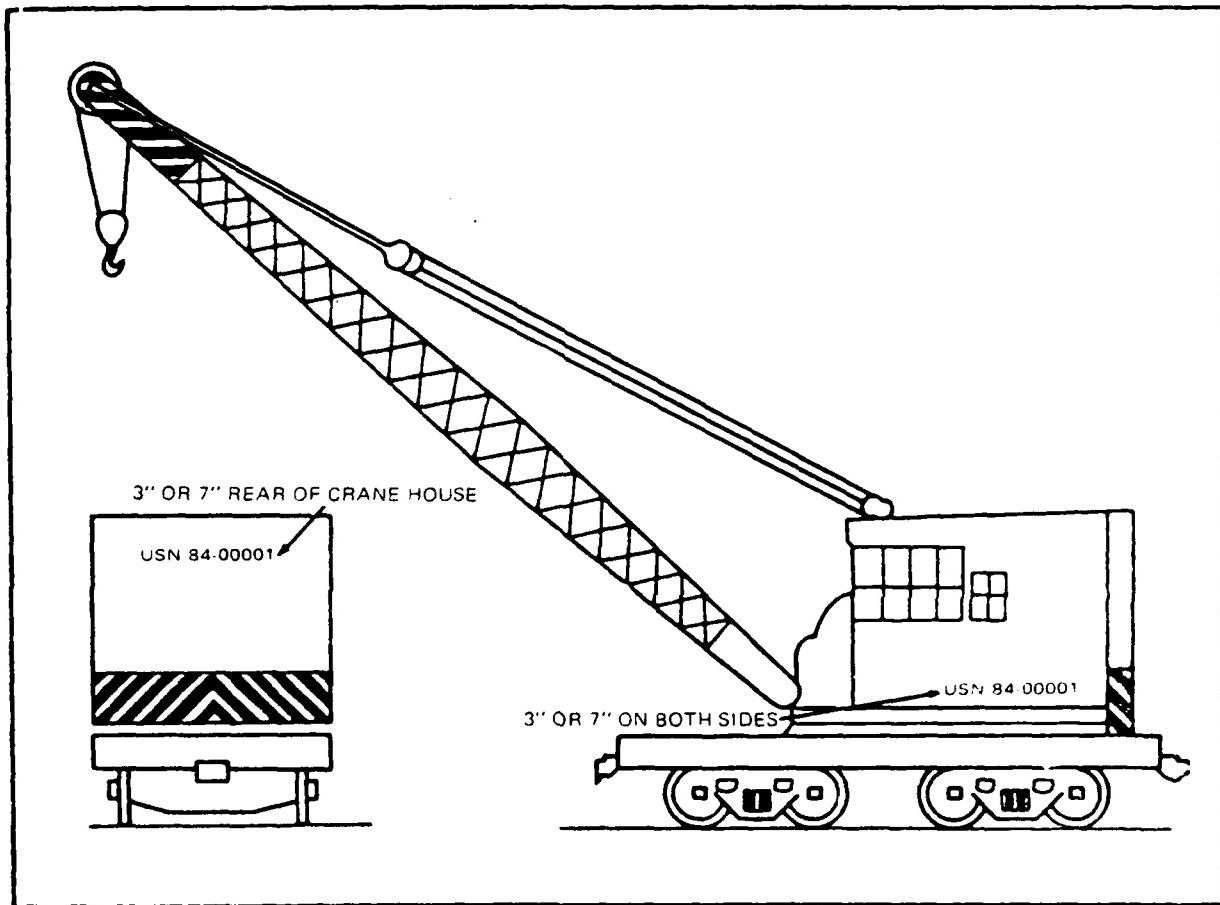


Figure 25-2 (continued)
Sizes and Locations of Markings

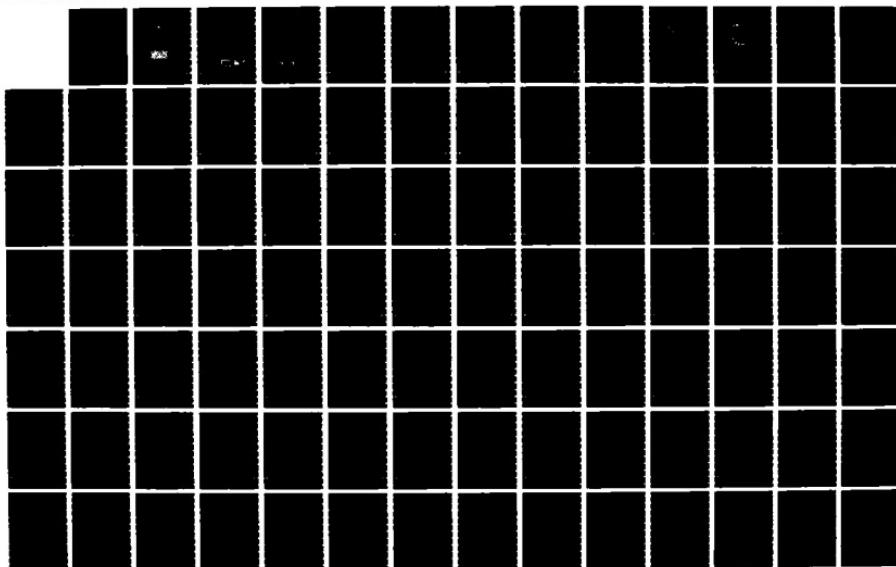
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FACILITIES ENGINEERING COMMAND ALEXANDRIA VA NOV 82
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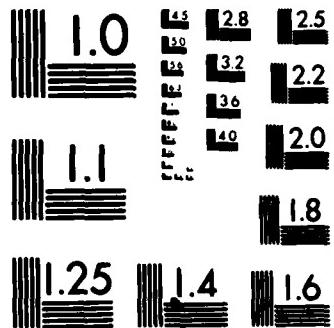
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

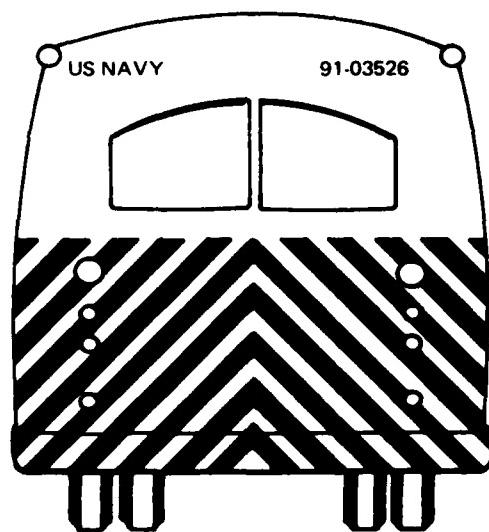


Figure 25-2 (continued)
Sizes and Locations of Markings
(Buses)

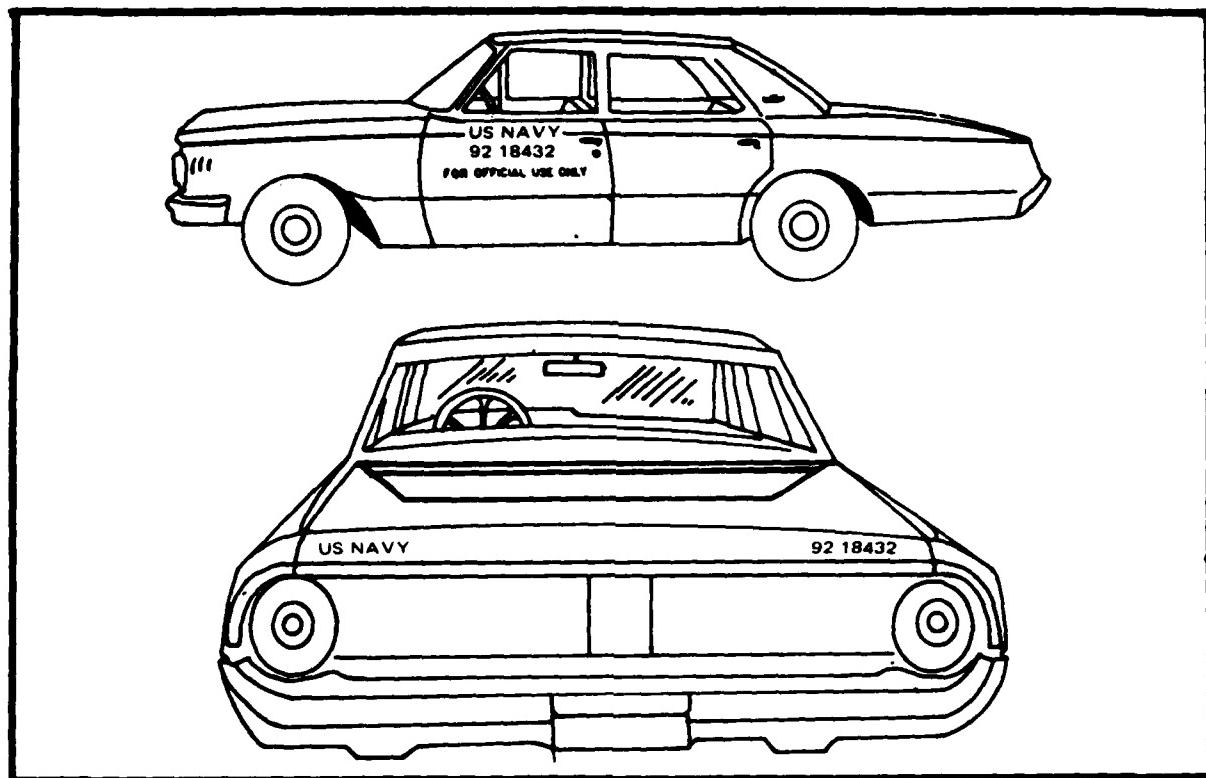


Figure 25-2 (continued)
Sizes and Locations of Markings
(Sedans)

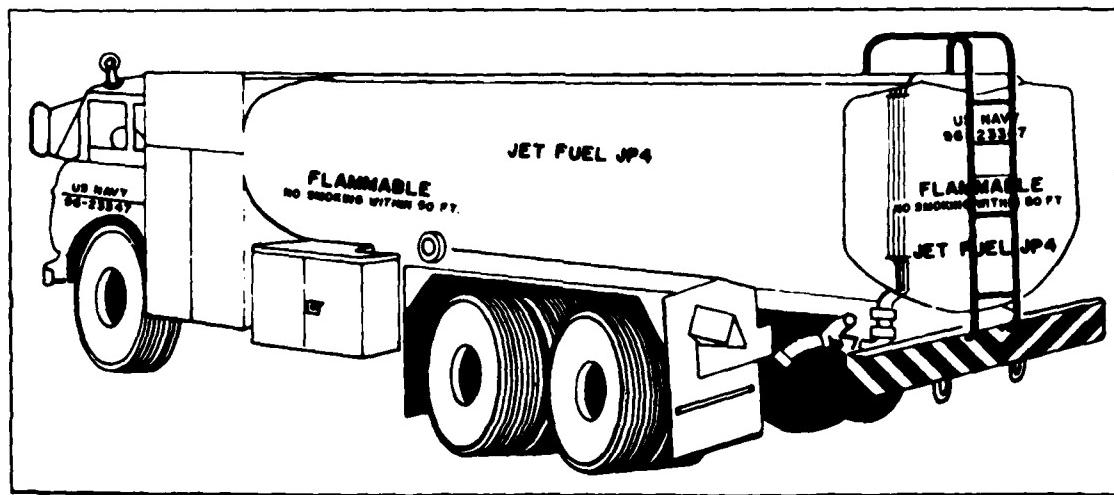
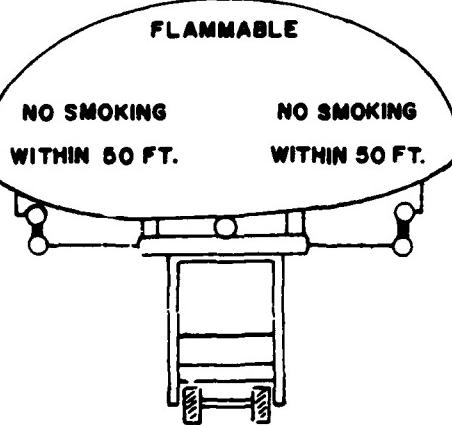
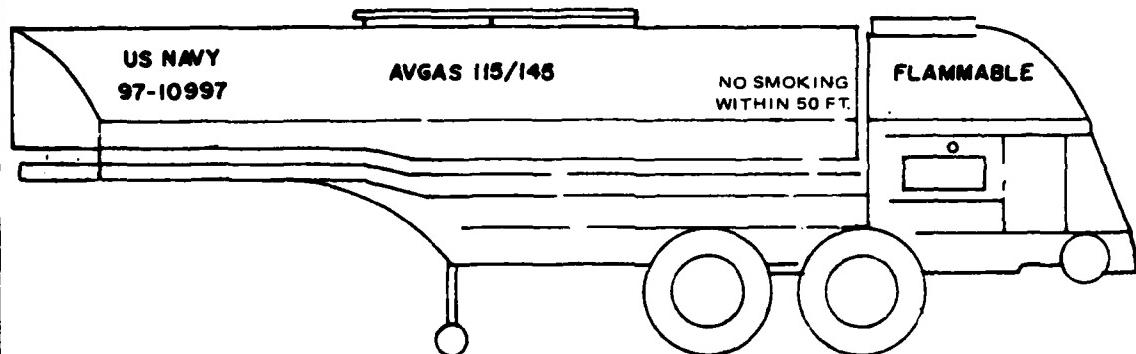


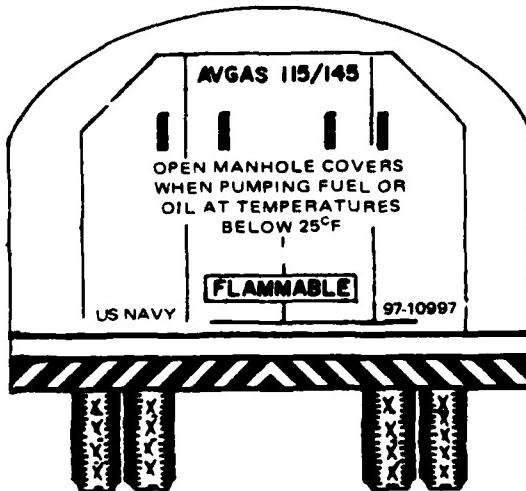
Figure 25-2 (continued)
Sizes and Locations of Markings
(Truck, Tank--Avgas or Jet Fuel)



FRONT ELEVATION



SIDE ELEVATION



REAR ELEVATION

Figure 25-2 (continued)
Sizes and Locations of Markings
(Semi-Trailer, Tanker--Avgas or Jet Fuel)

<u>Product</u>	<u>Marking</u>
Aviation gasoline,	
Grade 115/145 Octane	115/145 AVGAS
Jet fuel, Grade JP-4	P-4 JET FUEL
Jet fuel, Grade JP-5	JP-5 JET FUEL
Lubricating oil, Aviation	AVLUBE
Diesel fuel	DIESEL FUEL
Heating fuel	HEATING FUEL
Motor gasoline	MOGAS
Lubricating oil, motor	LUBE OIL

When Navy aircraft servicing tank trucks/trailers are used for dispensing approved NATO aviation fuels and lubricants, the equipment shall be suitably marked with the NATO symbols as well as the national designator. The NATO symbol shall be applied to each side of fuel and oil servicing vehicles immediately below the product identification. Symbols shall be the same size and color as product identification markings.

25-6. Painting on Removable Plates. To provide flexibility of tank vehicles at those stations that are frequently required to transfer units from one product to another, it shall be permissible to paint or use decals on signs on removable plates that can be bolted in place.

25-7. Aircraft Servicing and Aviation Mobile Ordnance Equipment. The rear flat surface will be painted black, then 4-inch stripes of yellow reflective sheeting conforming to Federal Specification L-S-300B, Type II, Class I, Reflectivity 1, Color J (FSN 9390-949-7610) shall be applied 4 inches apart at an incline of 45 degrees from the left and right of the center vertical starting pattern.

25-8. Temporary Identification of Vehicles. Vehicles not ordinarily used on landing areas, runways, taxiways, or peripheral roads must be readily identifiable whenever they travel over any part of the landing area. Each such vehicle is required to carry a flag on a staff attached to the vehicle. This flag will be at least 3 feet square and will consist of 1-ft squares of alternate international orange and white on both sides.

25-9. Warning Stripes.

a. Buses. All buses, unless otherwise prescribed by State or local law, shall be striped front and rear with diagonal safety markings. The stripes shall be applied in alternative 4-inch bands of black and yellow inclined 45 degrees to left and right of the center vertical starting pattern. The yellow band shall be fabricated from yellow reflectorized sheeting conforming to Federal Specification L-S-300B, Type II, Class I, Reflectivity 1, Color J (FSN 9390-949-7610).

b. Vehicles, Construction, and Allied Equipment. Variations in sizes and configurations as well as safety requirements necessitated by local conditions prohibit establishment of uniform instructions for the application of warning stripes. Such marking shall be in accordance with Note (1) to Table 25-1 as a minimum.

25-10. Hazardous Materials and Dangerous Articles. Navy vehicles used for transporting hazardous materials and other dangerous articles shall be marked and operated in accordance with the effective edition of the Drivers Handbook Ammunition Explosives and Dangerous Articles NAVSEA OP-2239 and the rules and regulations prescribed by the Federal Motor Carrier Safety Regulations, U.S. Department of Transportation, Federal Highway Administration, Bureau of Motor Carrier Safety.

25-11. Slow-Moving Vehicles. The slow-moving vehicle emblem shall be displayed on vehicles and equipment that do not exceed a speed of 25 miles per hour on the highway. The design and placement of the emblem shall be in accordance with Section 1910.145 subpart J (10) of Department of Labor Occupational Safety and Health Act (OSHA). The emblem consists of a fluorescent yellow-orange triangle with a dark red reflective border.

25-12. Flag Officer and VIP Identification. Flag Officers, Staff Officers of flag rank, and VIP's are authorized to display their flag rank on sedans by means of a special plate (see Figure 25-3). All other identification, painting, and marking instructions herein prescribed for Government-owned vehicles are to be strictly adhered to as required by law and regulations. Flag rank displays are to be confined to a plate attached to the front of the vehicle. Stars or replicas of personal flags are not to be painted on surfaces of the vehicle.

25-13. Ambulance Emblems and Markings. In addition to other prescribed identification markings set forth in DOD Regulation 4500.36R, the marking material for ambulance emblems and markings shall be applied using reflectorized tape conforming to Federal Specification L-S-300B, Type I, Class 3, Reflectivity 1. The reflective color used shall be: Orange (Color E). The belt line stripe shall be painted Omaha Orange using Dupont Paint No. 31L or equal. The emblems and markings shall be of the type, size, color and location as follows.

a. Front Markings.

(1) The word "AMBULANCE" in black letters 3 inches high shall be in mirror image and centered on the most verticle surface between the windshield and grille on forward control type ambulances and on the front of the body between the top of the cab and the top of the body on field type ambulances. The intent is that motorists looking through their rear view mirror can readily discern an approaching ambulance.

(2) Where space permits, a 3-inch block type orange cross on a 4-inch white field shall be located both to the right and left of the word "AMBULANCE."

b. Side Markings.

(1) A 6-inch block type orange cross shall be centered on the upper rear quarter panel.

(2) The word "AMBULANCE" in black 3-inch letters shall be located below the cross.

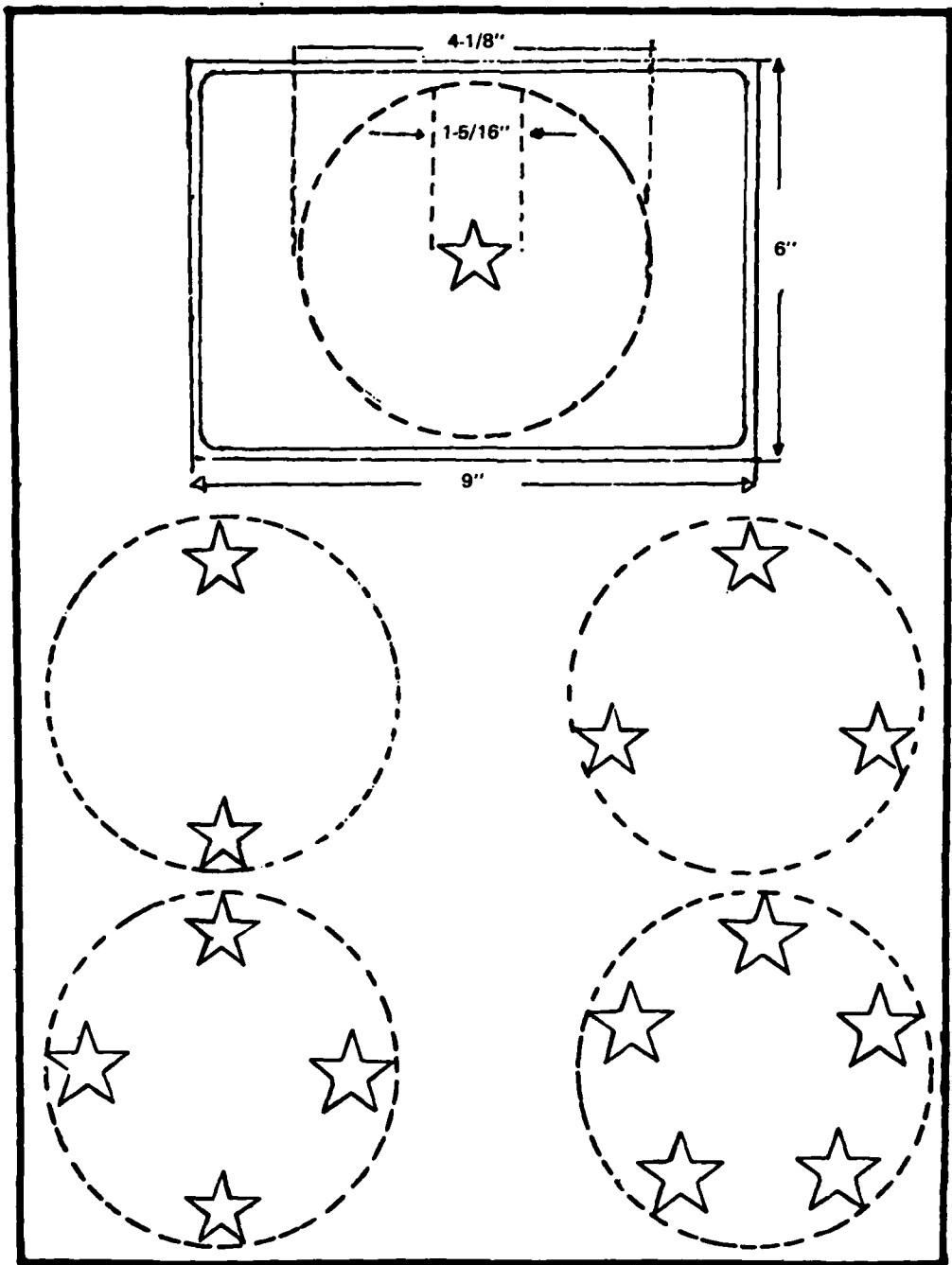


Figure 25-3
Navy Flag Officer Designation Plate

1. Vehicle flag plates of flag officers eligible for command at sea will consist of white stars on a blue background.
2. Vehicle flag plates of flag rank specialists not eligible for command at sea will consist of blue stars on a white background.

(3) An Omaha Orange stripe shall be painted at the vehicle belt line on both sides of the vehicle and across the rear of the vehicle. The belt line stripe shall extend forward to the front quarter panel. The belt line stripe shall be 6 inches wide at the sides and rear of the vehicle. This dimension may vary at the front quarter panel to conform to body configuration.

c. Rear Markings.

(1) A 6-inch block type Omaha Orange cross shall be centered on each rear door below the belt line stripe or window.

(2) The word "AMBULANCE" in black 3-inch letters shall appear once, centered across both doors and below the crosses.

(3) A 6-inch Omaha Orange stripe shall be painted across the rear doors at the vehicle belt line.

d. Top Markings A reflective orange cross may be centered on the top of the ambulance for more effective coordination of rescue efforts. Size of the cross will depend on the vehicle configuration and visual identification requirements from the air.

25-14. Recruiting Vehicles. Vehicles used for recruiting purposes may display signs and slogans in accordance with instructions promulgated by BUPERS or Commander, Recruit Command.

25-15. Exemptions from Identification Markings. The exemption referred to in DOD 4500.36R is modified to apply only to exterior markings and identification for Navy vehicles. Navy vehicles which are exempted from exterior markings shall be identified by painting the USN registration number on both the under-side of the trunk lid and on the inner side of the glove compartment lid. In lieu of painting, the registration number may be stamped on a corrosion-resistant metal plate to be affixed to either of the prescribed locations.

25-16. Additional Marking Exemptions. Requests for additional marking exemptions shall be submitted to the Chief of Naval Operations (OP-44) via command channels, and the appropriate EFD (TEMC).

25-17. Records of Exempted Vehicles. Each EFD (TEMC) shall maintain current inventory records of all administrative use motor vehicles that are authorized exemptions from the identification and marking provisions of DOD 4500.36R.

25-18. Removal of Markings. Upon permanent transfer to a disposal agency, or upon sale to commercial contractors, all Navy markings shall be obliterated or removed from the equipment.

25-19. Special Markings. All special markings not previously prescribed herein shall be approved by each Commanding Officer consistent with marking policies prescribed in DOD Regulation 4500.36R. Normally, such special identification marking should be limited to placement at the location where the vehicle license plate normally would be located.

CHAPTER 26. CORROSION PREVENTION OF EQUIPMENT

26-1. Corrosion Prevention. Vehicles and equipment at many shore activities are subject to atmospheric conditions or the application of salt for ice removal that is resulting in severe corrosion. Corrosion damage causes excessive maintenance expenditures to correct the damage, or significantly reduces the economic service life of the vehicles and equipment. Corrosion can be economically controlled by the proper application of protective coatings and adequate maintenance of these coatings. Vehicle and equipment manufacturers have in recent procurements been responsive to applying corrosion treating at the factory on all equipment except sedans. New vehicles should be examined to determine if they have been treated. If not, the following paragraphs outline procedures for effective application of approved protective coatings. It should be noted that there are a number of outside contractors franchised under "Ziebart" or "Tuff Kote" capable of treating vehicles.

a. Critical Body Locations Subject to Corrosion. Critical body corrosion primarily occurs in locations where poor ventilation allows moisture to accumulate on unprotected metal surfaces. Typical areas are where metal remains damp due to being coated with heavy moisture-laden road deposits. The interior of vehicle body doors, rocker panels, quarter panels, and corner posts are typical of the locations that are usually poorly ventilated. In many cases, the drain holes in these areas are improperly located or become clogged, causing moisture to remain for long periods of time and resulting in corrosion. Truck floors, under floor mats, tool compartments, door jambs, sills, skirts under doors and fenders, the brows above headlights, etc., are other locations subject to serious corrosion. It is important that all the critical locations be given corrosion preventive treatment with approved protective coatings.

b. Approved Corrosion Preventive Compound. Extensive research has been done to develop successful corrosion preventive compounds. Approved products are available commercially meeting new application military specification MIL-C-0083933A(MR) and interim military specification MIL-C-62218. Undercoatings which are normally cut back asphalt shall not be used for corrosion preventions. Studies indicate that these asphaltic compounds are unsatisfactory and will in fact accelerate corrosion due to the fact that they shrink away from the surface they are coating, causing pockets where moisture can accumulate.

c. Application Tools. In addition to the use of an approved corrosion preventive compound, the success of treatment requires getting the compound into body locations difficult to reach. This requires special tooling to be used with the airless type spray equipment. A number of spray equipment manufacturers are marketing such spray tools.

d. Body Cleaning and Preparation. Preparation of the areas to be covered with protective coatings is important to ensure proper adhesion and protection. The surfaces shall be reasonably clean, dry, and free from excessive rust, oil, grease, dust, road tar, and other foreign matter. Compound may be applied over old asphaltic undercoating.

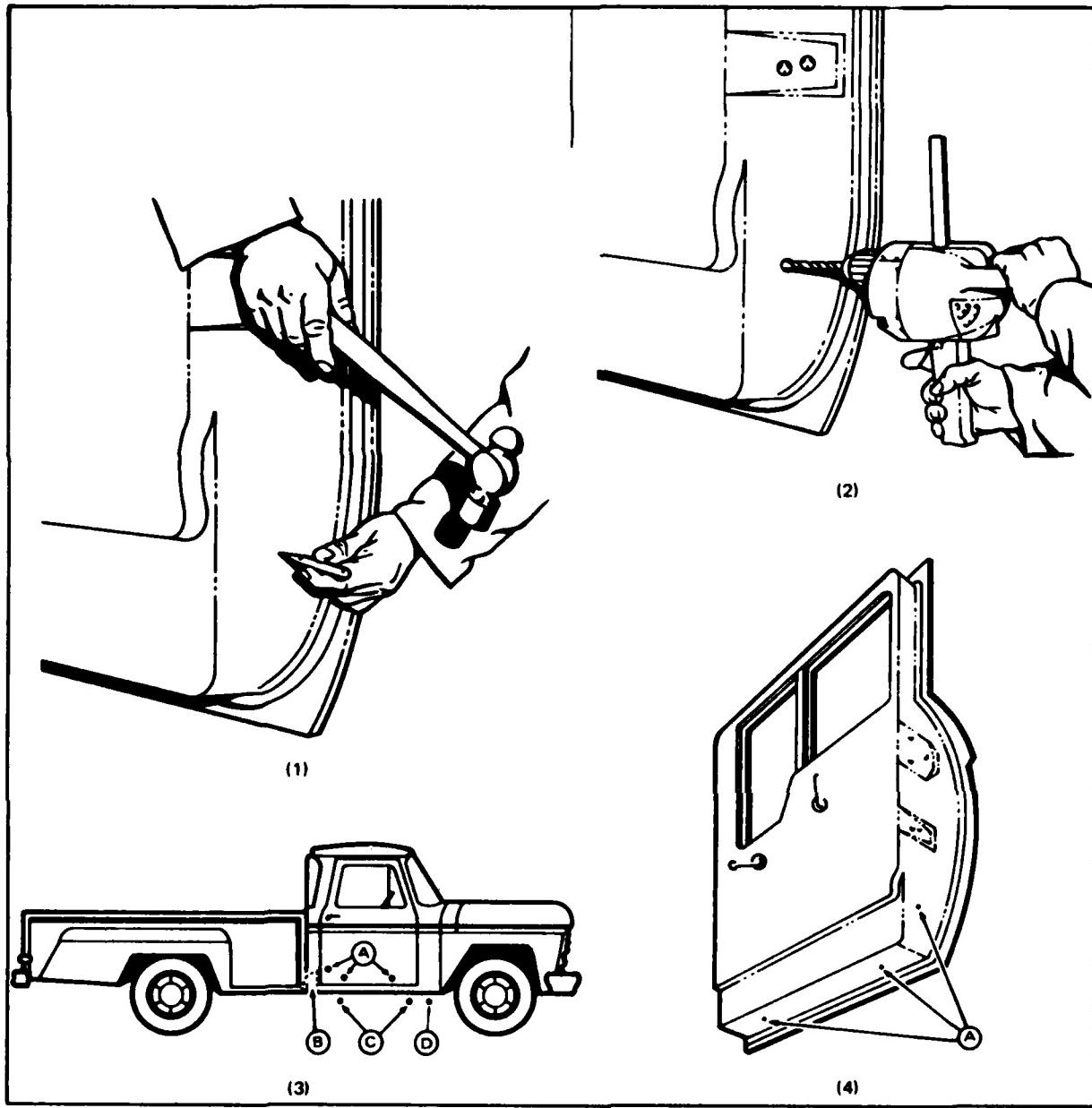


Figure 26-1
Application of Corrosion-Protective
Materials to Automotive Vehicle Bodies

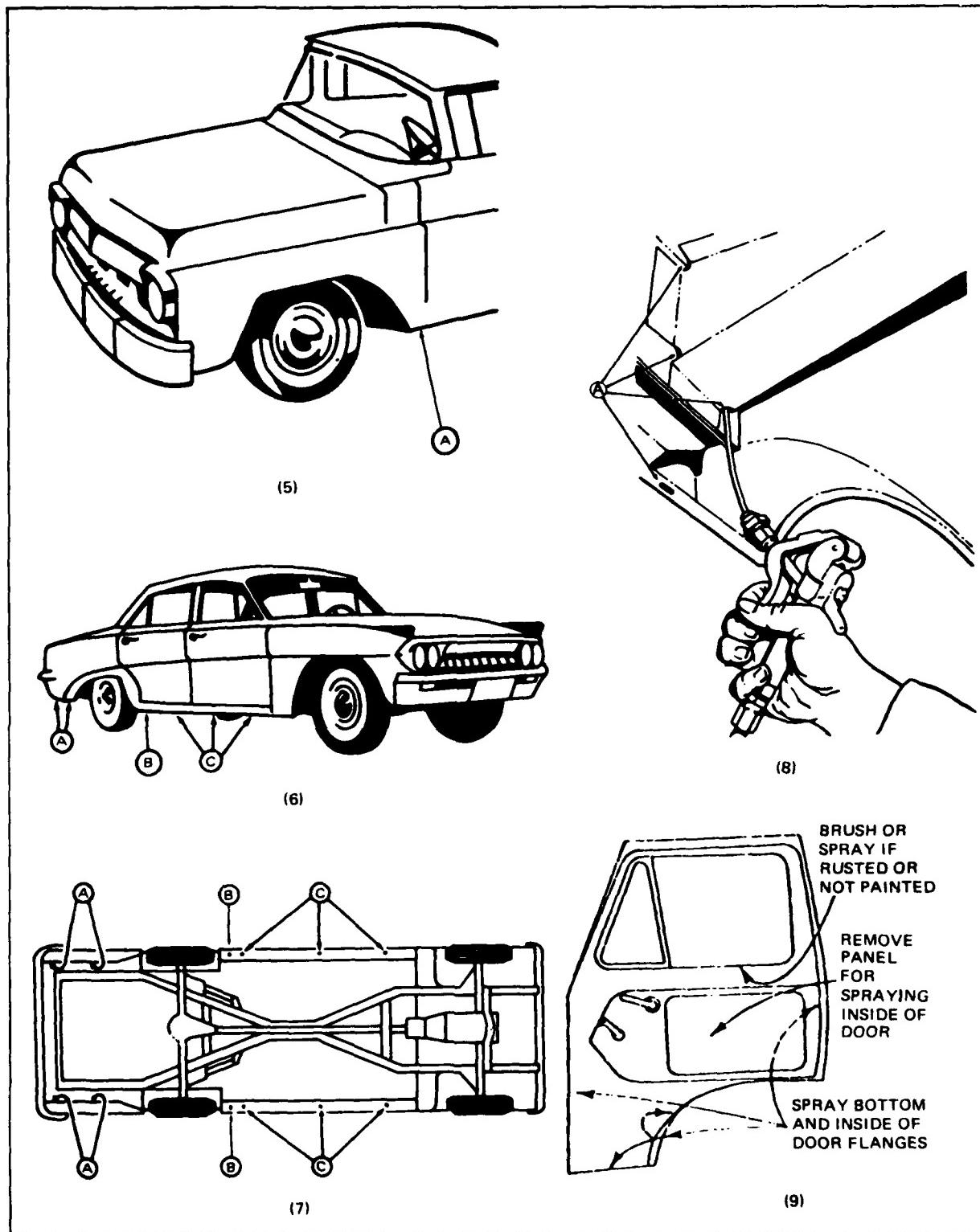


Figure 26-1 (continued)
Application of Corrosion-Protective
Materials to Automotive Vehicle Bodies

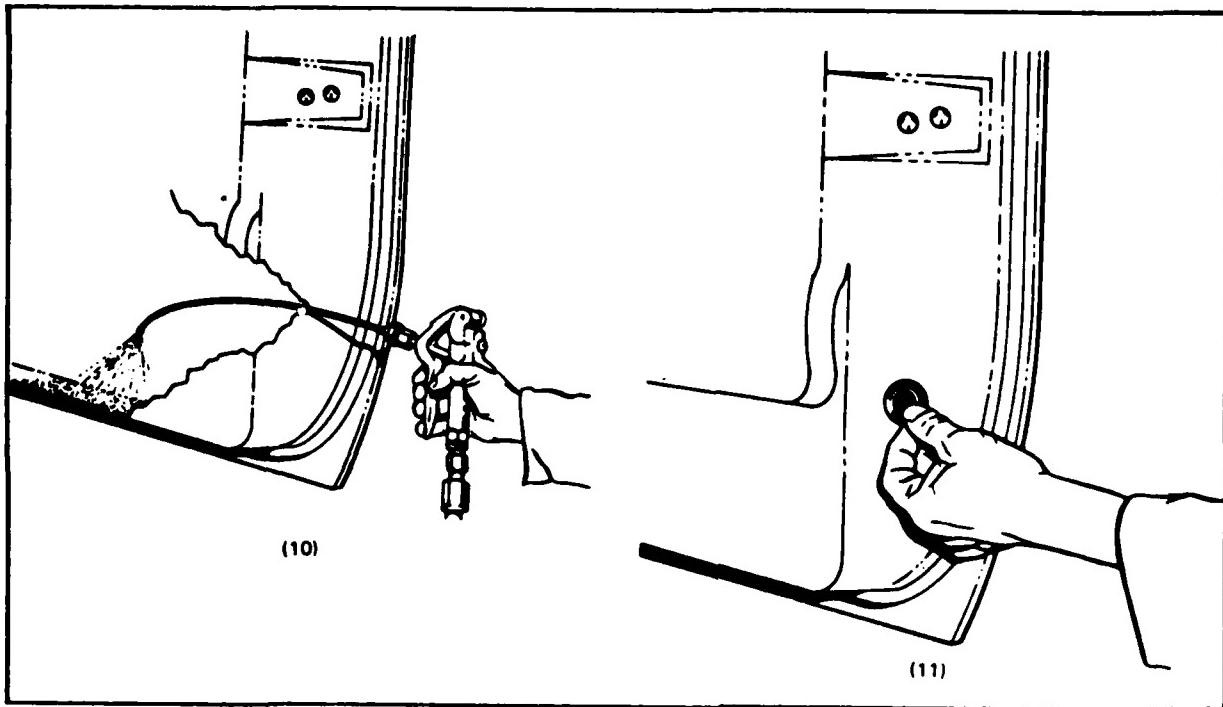


Figure 26-1 (continued)
Application of Corrosion-Protective
Materials to Automotive Vehicle Bodies

e. Body Preparation. To provide maximum corrosion protection, it is often necessary to drill or punch holes in certain body locations to permit the application of the protective coating material (see Figure 26-1). The size of the holes drilled or punched is determined by the size of spray tips used. Usually, a 1/2-inch hole is sufficient. When drilling into the underside of the body, it is important not to drill unnecessary holes, or drill in locations where the holes might weaken supporting members. The holes shall be drilled in the sides of a box section or channel and not in the upper or lower flanges. A careful examination of the body parts requiring protection, and the use of existing holes, will often reduce the number of additional holes required to be drilled. Following the drilling of the holes, it is advisable to examine the inner sections of the body for trapped moisture. The moisture can be removed with air pressure or by drilling small drain holes in appropriate locations.

f. Application of Protective Coatings.

(1) Undercarriage. If the vehicle has been previously undercoated, all areas shall be again sprayed with a coat of compound to ensure that all areas are completely covered. If the vehicle has not been undercoated, spray compound on the complete undercarriage, including body sections such as fenders, fender rolls, and headlight eyebrows. Compound may be used on the engine, transmission, drive shaft, axles, brake drums, and springs.

(2) Rocker Panels. Spray the interior of the rocker panels with compound by inserting the extension wand into drain or drilled holes. Be certain that the seams, bottom, and both sides are completely covered.

(3) Doors, Quarter Panels, Pillars, and Posts. Spray the interior with compound. Access to these areas is sometimes possible through removable panels or through openings for locks, hinges, and drain holes (see Figure 26-1). If these openings are inadequate for proper application of protective coatings, drill 1/2-inch holes in the vertical face of the doors, posts, etc. and spray interior surfaces by use of the extension wand (see Figure 26-1). When proper application is assured, cover the drilled holes with self-locking plastic plugs (see Figure 26-1).

(4) Body Interiors. Requirements for protective coatings in the passenger and cargo compartments vary with makes, models, and body types, and with different climatic areas. Interior surfaces that are most vulnerable to corrosion are floors, decks, and lower sections of cab interiors, tops, and windshield frames. These areas should be treated when necessary with compounds or paint depending upon the location of the critical surface. Compound may be used under floor mats and lower cab areas where there is no contact with clothing. Compound may be used in tops, side panels, windshield frames, etc. Paint should be used on doors, dash boards, cargo areas, floors, and sides and, in general, on any surface that permits contact with clothing or where decorative value is a consideration. In tropical areas where interior corrosion is severe, linings in headers and roof should be removed and treated.

CHAPTER 27. TECHNICAL INFORMATION AND PROCEDURES

27-1. Technical Publications. Technical publications are an essential tool of the transportation maintenance management program. There is a continuing need for both management and maintenance personnel to refer to authoritative sources of technical data. Maintenance management shall be able to refer readily to competent technical authority in support of decisions that pertain to technical procedures. It is the responsibility of maintenance management to constantly review and disseminate to maintenance personnel the latest technical data pertaining to the maintenance of the assigned equipment.

a. Equipment Manufacturers' Technical Publications. Each equipment manufacturer is required under the provisions of the purchase contract to furnish operator manuals, lubrication charts, parts manuals, and shop repair manuals with each purchase. If new equipment arrives without such documentation, the receiving activity should report this fact to CBC Port Hueneme immediately. Unless otherwise specified in this publication, the manuals provided by the manufacturer are the authoritative technical guides for maintenance of the equipment. Replacement manuals, or manuals for equipment transferred from one activity to another without manuals, can be obtained from CBC Port Hueneme (Code 153) by letter request; CBC Port Hueneme will provide any ordering instructions required. Original equipment manufacturers periodically publish service bulletins that provide further information concerning recommended modifications applicable to Navy-purchased equipment. Such service bulletins shall be considered the necessary authority to effect such modifications without further reference to NAVFACENGCOM or the cognizant EFD (TEMC).

b. Military Technical Publications. Technical publications covering specific equipment of military design, such as U.S. Army Technical Manuals (TM) and Modification Work Orders (MWO) constitute the authoritative technical information sources for maintenance procedures applicable to an item of equipment unless otherwise prescribed in this publication. Technical modifications to equipment recommended by the cognizant military service shall constitute all the necessary authority to effect such modifications.

c. Job Time Standards. Job time standards (otherwise known as "engineered performance standards" (EPS) or "flat rate standards") shall be applied by the estimator/inspector on all SRO's. The standards set forth in the following subparagraphs are the approved sources of standards for all equipment covered by the referenced publications. The commercial flat rate publications referenced normally provide two time standards: the manufacturer's (or factory) standard; and the commercial flat rate time (which includes a profit markup). In all cases, Navy activities shall use the manufacturer's job time standard on SRO's when estimating both in-house and commercial contract repair work. NAVFACENGCOM (Code 1202) shall be notified via the appropriate EFD of any standards in approved publications that appear to be unrealistic.

(1) General Purpose Vehicles.

(a) Motor's Flat Rate and Parts Manual, Motor, 250 W. 55th Street, New York, NY 10019.

(b) Chilton Flat Rate Manual, Chilton Company, Chilton Way, Radnor, PA 19089.

(c) Mitchell Manuals, "Mechanical Parts/Labor Estimating Guides"
P.O. Box 26260, , San Diego, CA 92126.

(2) Construction and Allied Equipment. The Construction and Allied Equipment Time Standards Repairs Guide, NAVFAC P-280, Navy Publications and Forms Center, 5801 Tabor Ave., Philadelphia, PA 19120; in seven volumes as follows.

- (a) 0000 Series: Tactical Military Automotive Equipment.
- (b) 2000 Series: Crushing, Mixing, Batching, and Paving.
- (c) 3000 Series: Drilling, Blasting, and Paving.
- (d) 4000 Series: Excavating, Grading, and Aircraft Towing.
- (e) 5000 Series: Miscellaneous Construction and Maintenance.
- (f) 7000 Series: Firefighting.
- (g) 8000 Series: Weight Handling.

(3) Equipment Manufacturers' Job Time Standards. Job time standards published by the equipment manufacturer may be used in lieu of any of the foregoing. In all cases where there is a time variation between the foregoing standards and those published by the equipment manufacturer, the manufacturer's standard shall be used.

d. Equipment Not Covered by Job Time Standards. Job time standards for equipment not covered by the foregoing shall be developed locally and approved for use in writing by the Transportation Division Director.

27-2. Procedures for Obtaining Technical Publications. Normally, commercial publications are procured by local purchase. Overseas activities without commercial sources of supply shall forward requisitions to the Naval Supply Centers at Oakland, CA or Norfolk, VA, as appropriate.

27-3. Manufacturers' Service Representatives. The transportation equipment industry generally has service representatives available throughout the world. These representatives are trained specialists with technical knowledge of their particular fields that is a valuable source of information to an equipment maintenance organization. As a general rule, the services of these representatives are provided without cost to the Government. The EFD's (TEMC's) are focal points for contact with such representatives, and can assist an activity in arranging for their services.

CHAPTER 28. FACILITIES LAYOUT FOR TRANSPORTATION MAINTENANCE SHOPS

28-1. General Criteria. Standard criteria for transportation shop layouts have been developed by NAVFACENGCOM. These standard criteria shall be used as guidelines in developing the most economical and efficient shop configuration. New construction shall combine the maintenance and operations functions for automotive, construction, weight handling, and railway equipment. Maximum accessibility of support areas to production bays, centralized administrative areas, and drive-through general repair bays that eliminate wasteful traffic aisles are typical of improved shop layout features. Activities planning new or modified facilities shall obtain assistance from the appropriate EFD (TEMC).

28-2. Shop Facilities Requirements Planning. Planning factors and other planning data for developing and reviewing requirements for transportation maintenance and operations facilities have been provided in Section 2, Chapter 3 of NAVFAC P-80, Facility Planning Factors for Naval Activities.

28-3. Shop Layout Details. Definitive drawings and design criteria have been developed for shop layouts. See NAVFAC P-272, Definitive Designs for Naval Shore Facilities, Part 1, Volumes 1 and 2, and NAVFAC DM-28, Design Manual for Maintenance Facilities. Activities planning modifications or new construction of transportation facilities may obtain guidance from NAVFACENGCOM (Code 1202).

**APPENDIX A. GENERAL DEFINITIONS AND TERMS, AND
GLOSSARY OF WEIGHT HANDLING EQUIPMENT TERMS**

1. General Definitions and Terms. Definitions and terms pertinent to this publication are as follows:

a. Administrative Use Motor Vehicles. The term "administrative use motor vehicles" means all wheeled-type pneumatic-tired motor vehicles normally of commercial design and transport type which are used for the movement of supplies, personnel, and equipment in providing administrative logistic support to installations or activities, including support of Government personnel at contractor-operated facilities. Vehicles of military design may also be designated and used for administrative purposes in which case they are so classified.

b. Automotive Vehicles. The term "automotive vehicles" includes trailers and all self-propelled motor vehicles designed for highway or cross-country operations. Specifically included are buses, sedans, trucks, carryalls, station wagons, ambulances, refuelers, defuelers, truck trailers, and brush, structural, and aircraft firefighting and rescue operation trucks. It does not include bicycles, vehicles designed primarily for use on rails, construction equipment, materials handling equipment, amphibious vehicles, or vehicles (with or without armor) designed for active participation in combat.

c. Civil Engineering Support Equipment. The term "Civil Engineering Support Equipment" as used in this publication is a procurement budget term referring to equipment for which NAVFACENGCOM has the responsibility for determining requirements, procuring, and assigning. The equipment includes automotive vehicles, construction, railway, firefighting, and mobile weight handling equipment. Weight handling such as portal, gantry, jib and other facility cranes normally fixed are not classified as CESE.

d. Construction Equipment. The term "construction equipment" means all mechanical equipment used in the construction, alteration, or repair of buildings, bridges, roads, or other kinds of real property. It includes pile drivers, power shovels and cranes with special attachments, road rollers, tractors, scrapers, plows, street sweepers, sprinkle carts, and the like; and portable boilers, pumps, and air compressors. It also includes such stationary machines and mechanical apparatus as rock crushing plants, concrete batching and mixing plants, and similar equipment used exclusively in the construction and maintenance of public works. When used as a general term "construction equipment" includes mobile weight handling equipment.

e. Hire of Motor Vehicles. This term includes charter or rental arrangements with commercial contractors or with the General Services Administration from its interagency motor pools. Hire of motor vehicles is further defined as "charter" when the driver is provided by the contractor, and as "rental" or "lease" when military or civilian personnel of DOD are used as drivers.

f. Public Works Lead Activity. A Public Works Lead Activity (PWLA) is defined as a CNO-designated Naval Shore Activity whose Public Works Department is responsible for the provision of a full spectrum of public works services, including assistance in facility planning, engineering consultation, design and other Public Works support functions, within a Naval complex which is comprised of (1) two or more contiguous activities; or (2) two or more Naval activities located within close proximity to each other, as appropriate. The type and extent of services provided will be delineated in mutually acceptable Intra-Service Support Agreements (ISSAs) executed between the PWLA and supported activities.

g. Maintenance. The term "maintenance" or "preventive maintenance" as used in this publication denotes all work functions performed on transportation equipment to determine, prevent, and correct physical damage and mechanical malfunctioning in the degree necessary to continue or restore the equipment to a safe and serviceable condition. The term "maintenance" includes the functions designated as inspection, lubrication, adjustment, service, repair, rebuild, part replacement, overhaul, and rehabilitation.

h. Maintenance Categories. It is the policy of the Navy to require efficient and uniform maintenance management policies, procedures, plans, and programs with a three-level concept for maintenance. These levels are defined as follows:

(1) Organizational Maintenance. That maintenance which is the responsibility of and performed by using organizations on its assigned equipment. Its phases normally consist of inspecting, servicing, lubricating, and the adjusting and replacing of parts, minor assemblies, and subassemblies.

(2) Intermediate Maintenance. That maintenance which is the responsibility of and performed by designated maintenance activities for direct support of using organizations. Its phases normally consist of calibration, repair, or replacement of damaged or unserviceable parts and providing technical assistance to using organizations. Intermediate maintenance is normally accomplished in fixed shops, tenders, or shore-based repair facilities, or by mobile field teams. (For CESE this is the normal maintenance provided by Public Works Departments or Public Works Centers.)

(3) Depot Maintenance. That maintenance which is the responsibility of and performed by designated maintenance activities to augment stocks of serviceable material and to support organizational maintenance and intermediate maintenance activities by the use of more extensive shop facilities, equipment, and personnel of higher technical skill than are available at the lower levels of maintenance. Its phases normally consist of inspection, test, repair, modification, alteration, modernization, conversion, overhaul, reclamation or rebuild of parts, assemblies, subassemblies, components, equipment end items, and weapon systems; the manufacture of critical nonavailable parts; and, providing technical assistance to intermediate maintenance organizations, using, and other activities. Depot maintenance is normally accomplished in fixed shops, shipyards, and other shore-based facilities, or by depot field teams. (For CESE this level of maintenance is not performed unless specifically authorized by NAVFACENGCOM (Code 1202).)

i. Maintenance Service. The term "maintenance service" is defined as the maintenance functions of inspection, lubrication, adjustment, and tightening.

j. Material Handling Equipment. The term "material handling equipment" means all self-propelled and conveyor equipment used in storage and materials handling operations in and around warehouses, shipyards, industrial plants, airfields, magazines, depots, docks, terminals, and on board ships. Included are warehouse tractors, forklift trucks, rough terrain forklift trucks, platform trucks, pallet trucks, conveyors and conveyor systems, straddle carrying trucks, and mobile cranes.

k. NAVFACENGCOM Engineering Field Division. The term "NAVFACENGCOM Engineering Field Division" as used in this publication is the Commanders and Commanding Officers of the Pacific, Atlantic, Northern, Southern, Western, and Chesapeake Divisions of NAVFACENGCOM.

l. Nonpassenger Carrying Vehicles. The term "nonpassenger carrying vehicles" means conventional type trucks and trailers that, in general, are not primarily intended for transportation of personnel. Although scooters, motorcycles, multiple-drive weapons carriers, jeeps, and prime movers can be used to transport personnel, all are classed as nonpassenger carrying vehicles.

m. Overseas Command. The term "overseas command" includes certain Fleet and Force commands in overseas areas outside of Naval Districts that have responsibilities for field coordination control of transportation equipment matters.

n. Passenger Carrying Vehicles. The term "passenger carrying vehicles" means sedans, station wagons, ambulances, and buses.

o. Public Works Center. A Public Works Center is defined as an independent command with the mission of providing the full range of public works services, including utilities, facilities maintenance, housing, transportation, engineering services, shore facilities planning support, and all other public works support required by operating forces, dependent activities, and other located at, and in the vicinity of, the naval complex being served by a PWC. Except for engineering services, including planning, this support is provided on a reimbursable basis.

p. Railway Equipment. The term "railway equipment" means all Navy-owned locomotives and rolling stock designed primarily for use on rails.

q. Rehabilitation. The term "rehabilitation" is defined as any one-time major overhaul of group or major repairs specifically planned and scheduled over a limited period of time which has the effect of extending the service life of the equipment 2 or more years.

r. Repair. The term "repair" is defined as those maintenance functions which restore individual parts, components, or assemblies of an equipment unit to a safe, serviceable condition. The term "repair" includes unit rebuild and unit replacement.

s. Special Purpose Vehicles. The term "special purpose vehicles" describes all vehicles not otherwise classified as administrative use motor vehicles. It is used to designate officially those vehicles which may be excluded from the general utilization program. It is applicable to those vehicles which are commercially designed to achieve a purpose which precludes its use in day-to-day, over-the-road operations. Examples of such vehicles are fire trucks and wreckers. The term includes vehicles originally designed for general transport but to which a unit of equipment has now been affixed which precludes its use as an administrative use motor vehicle. It does not include a unit otherwise used as an administrative use motor vehicle, but to which is temporarily attached (as a local expedient) an item of equipment such as a snowplow blade. The determination that the special purpose category applies will be made by NAVFACENGCOM EFD's (TEMCS).

t. Specialized Equipment. The term "specialized equipment" describes those vehicles or equipments which are designed, developed, and constructed for any office, bureau, or command for its own predominant use in performance of a service peculiar to that bureau or office. It includes those equipments which, though built with a standard engine and chassis, are otherwise modified to such a major extent that it can only be used by the specific command, bureau, or office.

u. Transportation Equipment. The term "transportation equipment" as may be used in this publication includes all types of automotive vehicles, construction, railway, firefighting, and weight handling equipment.

v. Transportation Equipment Management Center. This term means the component within NAVFACENGCOM EFD's located in Norfolk, Pearl Harbor, Chesapeake (Washington, DC), and Pensacola responsible for providing technical assistance to claimants on transportation equipment allowances and for administering the assignment, replacement, disposal, maintenance, and utilization of transportation equipment on a decentralized basis.

w. Weight Handling Equipment. The term "weight handling equipment" includes mobile or transportable truck, crawler and railway mounted locomotive cranes normally used for lifting, moving, and placing heavy material or equipment. The term also includes captive cranes of the gantry/portal and hammer-head type which are not included in the CESE program.

2. Glossary of Weight Handling Equipment Terms.

Accident. Any unplanned or unexpected event causing material loss or damage, or causing personnel injury or death. See OPNAVINST 5102.1.

A-Frame. On cranes equipped with booms, the structural portion exclusive of the boom above the rotate platform. On derricks, the stationary portion of the structural framing above the foundation or sills.

A-Frame Block. The lower block of luffing tackle usually integral with the apex of the A-frame. The term lower luffing block is preferred.

Alteration. Any change in the original manufacturer's design configuration. These are: (1) replacement of weight handling equipment parts and components with parts or components not identical with original (i.e., changes in material, dimensions, or design configuration); (2) the addition of parts or components not previously a part of the equipment; (3) the removal of components which were previous part of the weight handling equipment; and (4) rearrangement of original parts or components.

Automatic Mechanical Load-Lowering Brake. A completely mechanical brake placed in the gear train of a hoist, which functions only on lowering in conjunction with the electrical control of the motor, to control the speed of lowering and, with no power applied to the motor, to stop and hold the load.

Auxiliary Hoist. A separate hoist system of lighter load capacity and usually of higher speed than the main hoist.

Ballast. A weight (usually fixed) added to the nonrotating portion of a crane or derrick to provide the required stability of the crane or derrick as a whole.

Beam. Maximum width of vessel hull.

Bilge. The curve of ship's hull joining the side and bottom.

Bilge Keel. A fin fitted to the hull on each side of a vessel at the turn of the bilge to reduce rolling.

Billboard. A flat, usually inclined, platform on which to stow spare or emergency anchors.

Bitt. Double post fitting to which mooring lines from vessels are attached.

Bolster. The load-bearing crossbeam connecting, equalizing, and aligning a pair of parallel trucks on a two-rail track.

Boom. In crane and derrick usage, an inclined spar, strut, or other long member supporting the hoisting tackle.

Boom Hinge. The combination of the immediate parts of the rotate structure, boom, and (as most frequently used) the pin about which the boom turns when luffed.

Bridge. The main structural and mechanical portion of an overhead traveling crane spanning from one runway rail to the other, consisting of the girders supporting the trolley, the end trucks, the travel drive mechanism, and related parts.

Bridle. A two-legged device usually chain, wire rope, etc., which is used to transfer the pull of a single towline or anchor line to two fittings on a vessel.

Brush. The straightened ends of wire rope after preparation for application of a spelter socket.

Butt. The large end of a pile.

Bull Gear Pinion. The large gear (usually attached to the nonrotating part of a crane) and the mating pinion (usually attached to the rotating superstructure) by which the superstructure is caused to rotate.

Bull Wheel. A relatively large wheel attached to the base of mast and boom of a derrick with a rim shaped to accommodate two cables. By pulling on the cable, the boom is rotated by the bull wheel.

Bumper. A device fastened to a traveling crane or traveling portion of a crane to cushion the impact of striking another crane (or portion thereof) or a runway stop.

Cab. The compartment containing the controls for cranes or derricks and a seat and shelter for the operator.

Cage. A partially open circular ring that retains, spaces, and aligns the balls or rollers of an antifriction bearing, or the rollers or wheels of a live roller path. Also see "Cab."

Camber. The convexity of a deck line in the athwartship direction.

Capstan. A vertical drum or spindle on which a line is wound.

Center Steadiment. A pair of male and female castings or weldments, one connected to the fixed portion and the other to the revolving superstructure of a crane, for the purpose of maintaining the position of the center of rotation of the superstructure and of spider and cage of the roller path when used. When a center steadiment is used, the kingpin threads through it.

Chafing Block. Wood or brass wear plate used to prevent excessive wear or damage to cable.

Chock. A mooring fitting having faired inner surfaces for guiding lines.

Cleat. A mooring fitting having two horizontal arms to which mooring lines are secured.

Coaming. The vertical plate frame around the periphery of a vessel's deck or opening in deck.

Collector. A device maintaining contact between the moving and stationary parts of an electric circuit.

Combined Air and Water Jetting. A special method of jetting with a small air pipe attached either to the outside or inside of the water jet pipe.

Conductor. A metal bar, shape, or wire used to conduct electric current.

Contactor. A device, operated other than by hand, for repeatedly establishing and interrupting an electric power circuit.

Counter. That part of a ship's stern which extends beyond the rudder post forming a continuation of the lines of the hull.

Counterweight. Weight, usually attached to the rotating part of a crane, to provide stability to the rotating superstructure.

Crane Base. The portion of the supporting structure immediately below the roller path of a crane. In land cranes, it is a portion of the portal, underbody, carrier, or carbody. In floating cranes, it is that portion of the framing extending down to the deck of the pontoon.

Crane Jib. A boom or arm supporting a trolley or fall block, fitted to swing in sockets attached to a wall or column. The arm is generally fixed in a vertical direction but free to rotate horizontally.

Dead End. The fixed end of a rope or cable on a crane, derrick, or hoist.

Deadman. Concrete, plate, or other anchorage for a land or water tie.

Draft. Depth of vessel hull below the water line.

Drift. Motion after the power is cut off. Change of hook radius due to load.

Drift Point. An operating position of a motor control circuit in which all power is cut off from the motor but the electric brake remains energized, allowing the driven load to "drift" or "coast."

Duty. A requirement of service that defines the degree of regularity of the load. It is determined by the kind of loads to be handled and the facility to be served.

Duty Cycle. A complete operation from preparation for lifting a load to its final deposition, or a series of such movements--the kind, amount, sequence, frequency, duration, and period of work performed. A factor in determining mechanical, control, and electrical duty classifications and the design ratings of engines, generators, motors, gearing, clutches, brakes, bearings, and other parts.

Dynamic Braking. Braking a driven load by connecting an electrical control and motor circuit so that the motor becomes a generator under an overhauling load, absorbing energy from the load and returning it to the power input line, or wasting it as heat in special resistances, or both.

Eddy Current Brake. A brake consisting of a stationary magnetic field, usually variable, and a metallic rotor through which braking forces are exerted electromagnetically by the induced eddy currents in the rotor, the rotor absorbing the energy of motion, and dissipating it as heat. An eddy current brake can slow down but cannot stop a moving load.

Electric Control or Controller. A device or group of devices that serve to govern, in a predetermined manner, the electric power delivered to the apparatus to which it is connected. Some of the basic functions are the control of acceleration, retardation, line closing, and reversing.

Endurance Limit. The limiting stress below which the material will withstand, without fracture, an indefinitely large number of cycles of completely reversed stress.

Equalizer. A pivoted bar or frame upon which two loads may be maintained in constant relationship (most often equal) regardless of differences in elevation or horizontal attachment of the loads; usually used between trucks or undulating rails or surfaces, and between two lines whose length may be unequal. Example: A single sheave serves as an equalizer between two parts of line.

Fairlead. A group of pulleys or rollers used in connection with a winch or similar apparatus to permit the cable to be reeled from any direction.

Fender. A protective system installed around the hull of a floating vessel.

Fleet Angle. The angle formed by the lead of a rope at the extreme end of a drum with a line drawn perpendicular to the axis of the drum through the center of the nearest fixed sheave (expressed in degrees).

Fleeting Sheave. A sheave that moves along its supporting shaft or pin.

Float. In connection with traveling crane trucks, float is the total amount of lateral movement of the pairs of trucks on both sides of a crane that is permitted by their construction.

Freeboard. Distance from the main or weather deck on a floating vessel to the water line.

Full Magnetic Control or Controller. An electric control having all of its basic functions performed by electromagnets.

General Purpose Service (GPS). All Navy weight handling equipment other than special purpose service. Maintained in accordance with requirements of NAVFAC P-300.

Gudgeon. In crane usage, a vertical pin about which a travel truck (or its associated equalizers or bolsters) pivots in a horizontal plane and on which the weight of the truck usually bears.

Gudgeon Pin. In crane usage, a horizontal pin connected to a gudgeon that carries the weight of a crane to the trucks or equalizers, and on which the latter pivot in a vertical plane and frequently float.

Gypsy Head. A small, auxiliary revolving drum at the side or top of a winch.

Headache Ball. A heavy weight attached above the hook on a single line or whip hoist to provide sufficient weight to lower the hook when unloaded.

Headlog. Vertical transverse portion of the bow of a barge.

Heel. The transverse inclination of a vessel due to the action of the waves, the wind, or greater weight on one side, etc., usually transitory.

Hogline. Boom stay cable attached to the equalizer bar.

Hook, Double-Barbed. A hook with two symmetrical barbs from a common shank.

Hook Roller. A roller attached to the underside of the rotate platform, rolling under a projecting flange usually attached to the lower roller path to prevent the rotate platform from overturning.

Jogging (Notching, Inchng). The rapidly repeated closure of a circuit to start a motor from rest for the purpose of accomplishing small movements of the driven machine.

Kingpin (Centerpin). A vertical steel pin or hollow tube located at the center of rotation of a crane for the purpose of aiding in preventing overturning of the superstructure and also for maintaining the center of rotation in position. (See "Center Steadiment.")

Knuckle. Intersection formed by bilge side and stern plates just below the deck.

List. The angle between the horizontal plane and roller path plane measured athwartships for floating cranes.

Live Boom. A boom that is lowered by gravity solely under the control of the boom hoist drum brake.

Load Bearing Parts. Those parts of the weight handling equipment which support the load and upon failure could cause dropping, uncontrolled shifting, or movement of the load.

Load Brake. A brake which provides retarding force without external control.

Load Controlling Parts. Those parts of the weight handling equipment which position, restrain, or control the movement of the load, a malfunction of which could cause dropping, uncontrolled shifting, or movement of the load.

Luffing. The raising or lowering of a crane or derrick boom.

Main Hoist. Hoist system used for raising and lowering loads up to maximum rated capacity of the crane.

Major Deficiency. A deficiency of a load bearing or load controlling part.

Mandrel. A solid shaft used for driving shell casings of piles.

Manual Control or Controller. An electric control having all of its basic functions performed by hand.

Master Switch. A switch, usually in low current and low voltage circuits and operated by a crane or hoist operator, that dominates the operation of other control devices most often of greater current and voltage, such as contactors, relays, and other magnetically operated devices.

Minor Deficiency. A deficiency which is not associated with a load bearing or load controlling part.

Modification. See "Alteration." Any change in the original manufacturer's design configuration. These are: (1) replacement of weight handling equipment parts and components with parts or components not identical with original (i.e., changes in material, dimensions, or design configuration); (2) the addition of parts or components not previously a part of the equipment; (3) the removal of components which were previously part of the weight handling equipment; and (4) rearrangement of original parts or components.

Notch. Movement across or to mechanical notches that indicates by feel of the master switch handle the various speed points and which automatically centers the handle at the contact points.

Pawl. A gear locking device.

Performance. The effective operation of any device. The manner or behavior of equipment in operation.

Plugging. Creating a braking motion with an electric or hydraulic motor by applying energy to reverse the motor.

Pontoon. That portion of a floating crane, pile driver, dredge, or derrick that provides the necessary buoyancy for its support and stability as a whole.

Rack. A bar, straight or curved, with teeth or one face for gearing to a pinion, worm, or other mechanism.

Rating. Designated limit of operating characteristics based on specific conditions.

Reach. The horizontal distance from the hook to the center of rotation of a crane or derrick (radius and reach as used for crane are synonymous).

Reactor. A device that introduces reactance into an AC circuit for such purposes as motor starting, paralleling transformers, and control of current.

Reeving Arrangement. A plan showing the path that a rope takes in adapting itself to all sheaves and drums of a piece of equipment.

Regenerative Braking. In crane and hoist usage, braking a driven load that becomes overhauling by virtue of overspeed beyond the synchronous speed of an AC motor, the motor then becoming a generator which absorbs energy from the overspeeding load and returns it to the power input line.

Relay. A device that is operative by a variation in the conditions of one electric circuit to effect the operation of other devices in the same or another electric circuit.

Reportable Accident. All cases of accidental material (property) damage involving a repair/replacement cost greater than that specified in OPNAVINST 5102.1, or death or injury as specified in OPNAVINST 5102.1.

Roller Path. The circular rails or flat tracks or conical surface tracks on which rollers or wheels travel.

Rotate Platform (Turntable). That part of a rotating crane immediately above the roller path supporting the machinery, the machinery house, and cab.

Safety Device. Those parts of the equipment which inform or warn the operator of some condition or stop or lock some feature of the equipment; the failure of which could result in damage to or failure of the weight handling equipment.

Semimagnetic Control or Controller. An electric control having only a part of its basic functions performed by electromagnets.

Service Factors. Multipliers applied to ratings to adapt them to conditions of service other than those for which the ratings were established.

Shackle. A U-shaped fitting with a pin across the throat used as a connection between lengths of a chain or to attach other fittings.

Shall. As used in this publication, means the requirement is mandatory.

Sheer Strakes. The upper strake of the main shell plating just below the bulwarks.

Should. As used in this publication, means the requirement is recommended.

Shunt. A conductor of one of many forms joining two points in a circuit to form a parallel or bypass circuit through which a portion of the current may pass for the purpose of regulating the relative electrical characteristics of various portions of the circuit.

Skeg. Vertical appendage extending below the hull of a barge to reduce yawing.

Skylight. A built-up frame having glass fitted in the top and installed over a deck opening for the purpose of admitting light and air to compartment below.

Slow Speed Microdrive. Normally a modification to main hoist of portal cranes. Used in specialized applications where very slow speeds and high degree of control are required.

Smooth. Motion without any hesitation, abnormal vibration, binding, gross shimmy, or irregularity.

Spade or Multiple Jetting. Method of jetting in which a manifold chamber is set at the tip of a length of sheet piling. Steel teeth beyond the manifold and a line of jet holes in the bottom chamber give a chopping and flushing action as the jet is raised and lowered.

Special Purpose Service (SPS). Classification of weight handling equipment inspected, tested, certified, and validated to requirements of NAVFAC P-300 and NAVSEA 0989-030-7000 Lifting Standard which is used in shipyards and other activities to lift nuclear propulsion plant components and associated equipment.

Speed Point. One of a series of circuits and associated electrical control devices that control the various speeds and directions of a motor.

Speltered Socket. A type of connection for rope in which molten zinc is used.

Spider. The radial members connecting the roller cage with the center steadi-ment to maintain the true circular path of the rollers and to resist the out-ward thrust of the rollers.

Sponson. Overhanging section of vessel deck.

Spud. A movable member of any cross-sectional shape, attached to a part that has relative motion with another part, which may be inserted into a socket attached to the other part for the purpose of locking the two together (i.e., in dredging, the vertical anchor piles that fix a vessel during dredging. For cranes, normally locks the rotating portion of the crane to the nonrotating portion.)

Spud Lock. A device consisting of a spud and socket used for the purpose of preventing motion of the rotating structure of a crane while idle.

Stop. A fixed obstruction designed to contact the bumper of a traveling crane or trolley.

Test Load. Any load or force used for testing, the magnitude of which is known within acceptable tolerances and is so certified by the facility test director. Test loads shall be expressed in pounds.

Topping Block. The upper block of luffing tackle. The term upper luffing block is preferred.

Transom. The framework at the stern of a floating vessel.

Travel. The horizontal, usually straight-line motion, of a crane or its parts (such as a trolley).

Trim. Angle between the horizontal plane and roller path plane measured fore and aft.

Trolley. A wheeled carriage designed to support and transport a suspended load--the term includes all integral associated equipment for hoisting, sus-pending, and propelling the load.

Truck. The complete unit of frame, wheels, integral driving, and associated equipment that supports a traveling crane or a traveling portion of a crane, such as a trolley.

Tumbler. Pivot wheel at either upper or lower end of a bucket dredge ladder.

Two-block. The overhoisting of a set of tackle by direct hoisting or indi-rectly by lowering the boom so that the two blocks come together and further hoisting is thereby prevented.

Validation. Second level approval of the activity certification of cranes used in special purpose service by Engineering Field Divisions, normally consisting of verification of the proper conduct of the crane condition inspection and load test performed by the activity.

Vangs (Vang Lines). Lines attached to each side of a derrick boom near the outer end and to tackle on the base, ground, or pontoon by means of which the boom is rotated from one side to the other.

Weatherproof. Tightness such that exposure to the weather will not interfere with its successful operation.

Wheelbase. The distance between the centers of the most forward and most aft wheels on a traveling crane. On overhead traveling cranes with more than a total of four bridge wheels, the distance between the centers of the forward group of wheels and the aft group of wheels.

Whip Hoist. A hoist utilizing a single line only to the hook without other intervening tackle. Used for light loads and fast speeds.

Wildcat. A pocketed and slotted wheel on a winch over which the chain passes.

Windlass. A winch used to haul or hoist an object.

Wind Lock. A means, usually a spud lock, for preventing the motion of a crane that might be caused by the action of the wind.

Yaw. Rotary oscillation of a vessel about a vertical axis approximately through its center of gravity.

APPENDIX B. RELATED DIRECTIVES AND PUBLICATIONS

1. Related directives and publications containing information on the transportation program are as follows.

- a. Time Standards Repair Guide, NAVFAC P-280. Establishes time standards covering the repairs of "M" series automotive (tactical), and construction equipment.
- b. Testing and Licensing of Weight Handling and Construction Equipment Operators, NAVFAC P-306. Contains a uniform program and procedures for testing and licensing weight handling, and construction equipment operators.
- c. Organizations and Functions for Public Works Departments, NAVFAC P-318. Contains organizational data for the division of a field activity.
- d. Navy Drivers Handbook, NAVFAC MO-403. Contains procedures on safe and efficient operation of Navy vehicles.
- e. Transportation Cost Report (TCR), NAVCOMPT Manual, Volume 3, Chapter 7. Contains instructions and tables for use in the transportation reporting system. Volume 2 provides other related data.
- f. Management, Acquisition, and Use of Motor Vehicles, DOD Regulation 4500. 36R. Contains Department of Defense (DOD) policies and procedures concerning owned or controlled motor vehicles.
- g. Safety Precautions for Shore Activities, NAVMAT P-5100. Contains safety precautions for the protection of military and civilian personnel at naval shore activities.
- h. Navy Motor Vehicle Safety Program, OPNAVINST 5100.12. Contains instructions to inaugurate and maintain a motor vehicle safety program.
- i. Contracting Manual, NAVFAC P-68. Contains guidance on contracting procedures for transportation equipment.
- j. Defense Disposal Manual, DOD 4160.21M. Contains instructions for the reporting and disposing of excess transportation equipment.
- k. Special Services Manual, BUPERSINST 1710.11. Contains guidance on functions of activity special services.
- l. Navy Railway Operating Handbook, NAVFAC P-301. Contains procedures on safe and efficient operation of Navy railway equipment.
- m. Motor Vehicle Management Acquisition and Use of OPNAVINST 11240.16. Implements DOD Regulation 4500.36R.
- n. Centralized Management of Automotive Vehicles, Construction and Materials Handling Equipment, OPNAVINST 11240.8E.

- o. Catalog of Naval Shore Activities, OPNAV P09B2-105.
 - p. Office of Management and Budget Circular A-76. Contains policies for acquiring Commercial or Industrial (C/I) products and services needed by the Government.
 - q. Financial Management of Resources, NAVSO P-3006.1. Contains guidance in administration and accounting for resources in the operation and maintenance appropriations.
 - r. Lifting Standards for Weight Handling Equipment, NAVSEAINSTR 0989-030-7000.
 - s. Alteration/Modification of Shipyard Weight Handling Equipment, NAVSEAINSTR 11200.2. Contains instructions guidance for alterations or modifications to shipyard cranes.
 - t. NAVSEA S9086-BK-STM-000/CH-613 (Chapter 613), Wire and Fiber Rope and Rigging.
 - u. Ammunition and Explosives Ashore, NAVSEA Publication OP-5. Contains safety procedures for handling and transporting ammunition and explosives ashore.
 - v. Crane Load Stability Test Code, SAE J 765a. Contains procedures and direction for stability testing of cranes. (See Appendix M.)
 - w. American National Standards Institute, (ANSI) Standard A92.2. Electrical testing for aerial servicing platform trucks.
 - x. Coordination and Communication Between Public Works and Supply Department Personnel, NAVFAC/NAVSUPINST 11200.28.
 - y. Drivers Handbook Ammunition, Explosives and Dangerous Articles, NAVSEA Publication OP-2239. Contains procedure for safe and efficient transportation of ammunition, explosives, and dangerous articles by motor vehicle.
 - z. Federal Motor Carrier Safety Regulations, 496CR. Contains regulations of the Department of Transportation Federal Highway Administration Bureau of Motor Carrier Safety.
 - aa. Occupational Safety and Health Act, (OSHA). Section 1910.145/410 displays sample of emblem to be used on slow-moving vehicles.
 - bb. Facility Planning Factors for Naval Activities, NAVFAC Publication P-80. Contains factors for determining size of facilities.
 - cc. Definitive Designs for Naval Shore Facilities, NAVFAC Publication P-272.
 - dd. Design Manual for Maintenance Facilities, NAVFAC Publication DM-28.
 - ee. Rubber Manufacturers Association, 1901 Pennsylvania Ave. N.W., Washington, D.C. 20006. Provides tire maintenance and selection information.

APPENDIX C. TRANSPORTATION EQUIPMENT INDEX AND TABLE OF LIFE EXPECTANCIES FOR AUTOMOTIVE VEHICLES AND CONSTRUCTION EQUIPMENT
(INDEXED BY NAVFAC EQUIPMENT CODE)

NOTES

1. P-1 Line Item Numbers 01 through 10 and 31 identify Transportation Equipment Procurement Program items. In order to compile a comprehensive index of all NAVFAC Equipment Code numbers, the following P-1 Line Items have been included which represent special purpose items designed for a specific function and which are not included in the Shore Activities Transportation Equipment Program under the procedures of NAVFACINST 11200.12 (latest edition):

- P1-96 Ships' Waste and Oil Pollution Abatement Equipment
Cognizant Agency: NAVFACENGCOM Environmental Quality Division,
Code 112
- P1-97 Special Purpose Equipment
Cognizant Agency: Claimant receiving benefits of equipment
- P1-98 ABC Warfare Disaster Preparedness Decontamination Equipment
Cognizant Agency: NAVFACENGCOM Readiness Planning Division,
Code 062
- P1-99 Mobile Utility Support Equipment (MUSE)
Cognizant Agency: NAVFACENGCOM Facilities Maintenance Division,
Code 111

2. Claimants requiring special purpose items will administer and fund for their procurement and replacement through the agencies shown, where applicable.

3. See Appendix G for NAVFAC 15-character Abbreviated Description, Expanded NAVFAC Long Description, and DOD Alpha Code. These descriptions will be used in all CESE transactions.

4. See Appendix D for detailed descriptions of Family Equipment Items.

**TRANSPORTATION EQUIPMENT INDEX AND TABLE OF
LIFE EXPECTANCIES**

NAVFAC Equipment Code	Description	P-1	Life Expectancy	
		Line Item Number	Years	Miles
0060	BUS, MOTOR, BOC, 12-PASS, AIRPORT, 4X2	01	8	84,000
0061	BUS, MOTOR, BOC, 16-20 PASS, 4X2	01	8	84,000
0062	BUS, MOTOR, BOC, 29-30 PASS, 4X2	01	8	84,000
0063	BUS, MOTOR, BOC, 36-60 PASS, 4X2	01	8	84,000
0065	BUS, MOTOR, BOC, 45-PASS, FORWD CON, 4X2	01	10	150,000
0066	BUS, MOTOR, BOC, 45-PASS, RR LD AMB CONV	01	10	150,000
0067	BUS, MOTOR, BOC, 45-PASS, SD LD AMB CONV	01	10	150,000
0070	BUS, MOTOR, INTEG, 35-47 PASS, DED, CITY	01	12	300,000
0071	BUS, MOTOR, INTEG, 37-47 PASS, W/AMB CON	01	12	300,000
0090	SEMITRAILER, W/PASSENGER BUS CONVERSION	03	15	-
0095	LAB, INERTIAL, MOBILE, SELF-PROPELLED	97	12	300,000
0098	UNIT, MED/DENTAL, MOBILE, SELF-PROP, 4X2	02	12	300,000
0099	UNIT, X-RAY, MED, MOBILE, SELF-PROP, 4X2	02	12	300,000
0102	AUTO, SEDAN, INTERMED, 5-PASS, 4-DR, 4X2	01	6	72,000
0103	AUTO, SEDAN, SUBCOMPACT, 2-DR, 4X2	01	6	72,000
0104	AUTO, SEDAN, COMPACT, 5-PASS, 4-DR, 4X2	01	6	72,000
0105	AUTO, SEDAN, LIGHT, 5-PASS, 4-DR, 4X2	01	6	72,000
0106	AUTO, SEDAN, MEDIUM, 5-PASS, 4-DR, 4X2	01	6	72,000
0114	AUTO, SEDAN, COMPACT, LAW ENFORCEMENT	01	6	72,000
0200	AUTO, STA WAGON, LIGHT, 6-8PASS, 4D, 4X2	01	6	72,000
0202	AUTO, STA WAGON, INTERMED, 6-8 PASS, 4X2	01	6	72,000
0205	AUTO, STA WAGON, W/AMBULANCE CONVER, 4X2	02	6	72,000
0210	AUTO, STA WAGON, COMPACT, 5-PASS, 4X2	01	6	72,000
0220	AUTO, STA WAGON, SUBCOMPACT, 2/4-DR, 4X2	01	6	72,000
0297	AUTOMOBILE, AMBULANCE, FOREIGN, 4X2	02	8	60,000
0299	AUTOMOBILE, AMBULANCE, METRO, 4X2	02	8	60,000
0302	TRUCK, UTILITY, MILITARY, WWII, 4X4	02	6	72,000
0303	TRUCK, ELECTRONICS UNIT, 4X4	97	6	72,000
0305	TRUCK, UTILITY, COMMERCIAL, 4X4	02	6	72,000
0306	TRUCK, AMBULANCE, FRONT LINE, M-SER, 4X4	02	8	60,000
0307	TRUCK, UTILITY, M-SERIES, W/WO WINCH 4X4	02	6	72,000
0308	TRUCK, UTILITY, COMMERCIAL, 4X2	02	6	72,000
0310	TRUCK, ELECTRONICS UNIT, 4X2	97	6	72,000
0311	TRUCK, CARRYALL, 8-PASSENGER, 4X2	02	6	72,000
0312	TRUCK, PANEL, 4X2	02	6	72,000
0313	TRUCK, CARGO, PICKUP, 4X2	02	6	72,000
0314	TRUCK, PANEL, AMBULANCE CONVERSION, 4X2	02	8	60,000
0315	TRUCK, MULTISTOP DELIVERY, 4X2	02	6	72,000
0316	TRUCK, CARGO, PICKUP, 4X4	02	6	72,000
0317	TRUCK, CARRYALL, 8-PASSENGER, 4X4	02	6	72,000
0318	TRUCK, PANEL, 4X4	02	6	72,000
0319	TRUCK, CARGO, PICKUP, COMPACT, 4X2	02	6	72,000
0320	TRUCK, MULTISTOP, FORWARD CONTROL, 4X2	02	6	72,000
0322	TRUCK, CARGO, PICKUP, 4X2	02	6	72,000
0324	TRUCK, ELECTRONICS UNIT, 4X2	97	6	72,000

NAVFAC Equipment Code	Description	P-1 Line Item Number	Life Expectancy	
		Years	Miles	
0325	TRUCK, CARGO, M-SERIES, W/WO WINCH, 4X4	02	6	72,000
0326	TRUCK, CARGO, PICKUP, 4X4	02	6	72,000
0327	TRUCK, CARGO, PICKUP, 6M, 4-DR, 4X2	02	6	72,000
0328	TRUCK, CARGO, PICKUP, 6M, 4-DR, 4X4	02	6	72,000
0329	TRUCK, PANEL, FORWARD CONTROL, GED, 4X2	02	6	72,000
0330	TRUCK, CARRYALL, F/C, 8-PASS, GED, 4X2	02	6	72,000
0331	TRUCK, AMB, FIELD, MIL, 4-LITTER, 4X4	02	8	60,000
0332	TRUCK, AMB, FIELD, COM, 4-LITTER, 4X4	02	6	72,000
0333	TRUCK, AMB CONV, COM, 2-LITTER, FC, 4X2	02	6	72,000
0334	TRUCK, UTILITY, WEAPON CARRIER, 4X4	02	6	72,000
0335	TRUCK, VAN, COMPACT, W/ELEV TOP, FC, 4X2	02	6	72,000
0336	TRUCK, PANEL, PADDY WAGON, FC, 4X2	02	6	72,000
0340	TRUCK, ELECTRONICS UNIT	97	7	84,000
0341	TRUCK, PANEL, 4X2	02	7	84,000
0342	TRUCK, CARGO, PICKUP, 4X2	02	7	84,000
0343	TRUCK, STAKE, 4X2	02	7	84,000
0344	TRUCK, CARGO, 4X4	02	7	84,000
0345	TRUCK, MULTISTOP DELIVERY, 4X2	02	7	84,000
0346	TRUCK, MULTISTOP, F/C, AIRCRAF MAIN, 4X2	02	7	84,000
0348	TRUCK, CARGO, PICKUP, 4X4	02	7	84,000
0349	TRUCK, PANEL, 4X4	02	7	84,000
0350	TRUCK, CARRYALL, 8-PASSENGER, 4X4	02	7	84,000
0352	TRUCK, BOMB SERVICE, 4X4	02	7	84,000
0355	TRUCK, CARGO, PICKUP, 6M, 4-DR, 4X4	02	7	84,000
0360	TRUCK, CARGO, M-SERIES, W/WO WINCH, 4X4	02	7	84,000
0361	TRUCK, AMBULANCE, M-SERIES, 4X4	02	7	84,000
0362	TRUCK, VAN, F/C, HI-VOL, 4X2	02	7	84,000
0409	TRUCK, MINIVAN, F/C, RECRUIT, GED, 4X2	97	7	84,000
0410	TRUCK, VAN, F/C, RECRUIT, CUST, GED, 4X2	97	8	84,000
0420	TRUCK, MULTISTOP DELIVERY, 4X2	02	7	84,000
0421	TRUCK, CAB & CHASSIS, 4X2	02	7	84,000
0423	TRUCK, DUMP, 4X2	02	7	84,000
0424	TRUCK, EXPRESS, 4X2	02	7	84,000
0426	TRUCK, STAKE, 4X2	02	7	84,000
0428	TRUCK, VAN, 4X2	02	7	84,000
0430	TRUCK, ELECTRONICS UNIT, 4X2	97	7	84,000
0438	TRUCK, BOMB SERV, W/HYD SWING CRANE, 4X4	02	8	84,000
0439	TRUCK, CARGO, BOMB SERVICE, M-SER, 4X4	02	7	84,000
0441	TRUCK, CAB & CHASSIS, 4X2	02	7	84,000
0443	TRUCK, DUMP, 4X2	02	7	84,000
0445	TRUCK, STAKE, 4X2	02	7	84,000
0446	TRUCK TRACTOR, 4X2	02	7	84,000
0449	TRUCK, VAN, 4X2	02	7	84,000
0450	TRUCK, VAN, REFRIGERATOR, 4X2	02	7	84,000
0455	TRUCK, STAKE, 4X4	02	7	84,000
0456	TRUCK, DUMP, 4X4	02	7	84,000
0457	TRUCK, VAN, 4X4	02	7	84,000
0520	TRUCK, VAN, ELECTRONICS UNIT, 4X2	97	8	84,000

NAVFAC Equipment Code	Description	P-1 Line Item Number	Life Expectancy	
			Years	Miles
0521	TRUCK, CAB & CHASSIS, 4X2	02	8	84,000
0523	TRUCK, DUMP, 4X2	02	8	84,000
0525	TRUCK, STAKE, GED, 4X2	02	8	84,000
0526	TRUCK TRACTOR, 4X2	02	8	84,000
0527	TRUCK, VAN, 4X2	02	8	84,000
0530	TRUCK TRACTOR, DED, 4X2	02	8	84,000
0532	TRUCK, CARGO, WITH OR WITHOUT WINCH, 6X6	02	8	84,000
0533	TRUCK, DUMP, M-SERIES, 6X6	02	8	84,000
0534	TRUCK, STAKE, 6X6	02	8	84,000
0535	TRUCK TRACTOR, 6X6	02	8	84,000
0536	TRUCK, VAN, M-SERIES, 6X6	02	8	84,000
0537	TRUCK, CAB & CHASSIS, M-SERIES, 6X6	02	8	84,000
0539	TRUCK, CARGO, M-SERIES, W/WO WINCH, 6X6	02	8	84,000
0540	TRUCK, BOMB SERVICE, M-SERIES, 6X6	97	8	84,000
0545	TRUCK TRACTOR, 4X2	02	8	84,000
0550	TRUCK, ELECTRONICS UNIT	97	8	84,000
0570	TRUCK, AMPHIBIAN, LARC-5, 4X4, 5-TON	97	8	84,000
0580	TRUCK, DUMP, 6X4	02	10	150,000
0582	TRUCK, STAKE, 6X4	02	10	150,000
0583	TRUCK TRACTOR, DED, 4X2	02	10	150,000
0587	TRUCK, DUMP, M-SERIES, 24-VOLT, 6X6	02	10	150,000
0588	TRUCK, CARGO, M-SERIES, 24-VOLT, 6X6	02	10	150,000
0590	TRUCK, VAN, REFRIGERATOR, 4X2	02	10	150,000
0591	TRUCK, CAB & CHASSIS, M-SERIES, 6X6	02	10	150,000
0601	TRUCK, CAB & CHASSIS, 4X2	02	10	150,000
0602	TRUCK, DUMP, 4X2	02	10	150,000
0603	TRUCK, STAKE, 4X2	02	10	150,000
0604	TRUCK TRACTOR, 4X2	02	10	150,000
0605	TRUCK, VAN, 4X2	02	10	150,000
0606	TRUCK TRACTOR, 4X4	02	10	150,000
0607	TRUCK TRACTOR, 6X6	02	10	150,000
0609	TRUCK TRACTOR, 6X4	02	10	150,000
0610	TRUCK, VAN, ELECTRONICS UNIT	97	10	150,000
0613	TRUCK, STAKE, 6X4/6X6	02	10	150,000
0614	TRUCK TRACTOR, 4X2/6X2	02	10	150,000
0615	TRUCK, PRIME MOVER, 6X6	02	10	150,000
0616	TRUCK TRACTOR, YARD SPOTTER, DED, 4X2	02	10	150,000
0617	TRUCK TRACTOR, 6X4	02	10	150,000
0618	TRUCK, VAN, ELECTRONICS UNIT	97	10	150,000
0620	TRUCK TRACTOR, 4X2	02	12	300,000
0623	TRUCK TRACTOR, DED, 4X2	02	12	300,000
0624	TRUCK, VAN, 4X2	02	12	300,000
0625	TRUCK TRACTOR, 4X4	02	12	300,000
0630	TRUCK TRACTOR, 6X4	02	12	300,000
0631	TRUCK, DUMP, 6X4/6X6	02	12	300,000
0632	TRUCK, STAKE, 6X4	02	12	300,000
0633	TRUCK TRACTOR, DED, 6X4	02	12	300,000
0636	TRUCK, STAKE, DED, 6X4	02	12	300,000

NAVFAC Equipment Code	Description	P-1 Line Item Number	Life Expectancy	
		Years	Miles	
0638	TRUCK TRACTOR, 6X6	02	12	300,000
0643	TRUCK, STAKE, 6X4	02	12	300,000
0644	TRUCK, DUMP, 6X4/6X6	02	12	300,000
0645	TRUCK TRACTOR, 6X4	02	12	300,000
0649	TRUCK TRACTOR, DED, 6X4	02	12	300,000
0701	TRUCK, CARGO, AMPHIBIAN, CRWLR/PRT	02	7	84,000
0703	TRUCK, GUIDED MISSILE/WEAPONS SERVICING	97	7	84,000
0704	TRUCK, AMMUNITION, W/HYD CRANE, 4X2/4X4	02	7	84,000
0705	TRUCK, AIRFIELD CONTROL TOWER, MOBILE	97	7	84,000
0706	TRUCK, TRANSPORTER, PILOTS W/PRESS SUITS	97	7	84,000
0707	TRUCK, AIRFIELD MAINT/AMMO TRANSPORTER	02	7	84,000
0708	TRUCK, PLATFORM, UTILITY, 3 OR 4-WHEEL	02	4	20,000
0709	TRUCK, FIELD SERVICING	02	7	84,000
0710	TRUCK, LUBRICATION SERVICE	02	7	84,000
0711	TRUCK, ARMORED (PAYROLL)	02	8	84,000
0713	TRUCK, TIRE SERVICING	02	8	84,000
0714	TRUCK, CARGO, W/DRY CHEMICAL UNIT INSTL	09	6	72,000
0715	TRUCK, MULTIPURP, PIPELINE CONST, M-SER	02	8	84,000
0717	TRUCK, VAN, REFRIGERATOR	02	10	150,000
0719	TRUCK, FOOD/BEVERAGE, WINDOW SERVICE	02	7	84,000
0720	TRUCK, MISC, EXHIBIT/TRAINING/RECRUITING	97	10	150,000
0721	TRUCK, VAN, TEST FAC/CALIBRATION SERVICE	97	7	84,000
0722	TRUCK, MAINT, TELEPHONE/UTILITY, 4X2/4X4	02	7	84,000
0723	TRUCK, MAINT, POLE/LINE CONSTR, GED, 4X2	02	7	84,000
0724	TRUCK, STAKE/PICKUP, W/LADDER, GED, 4X2	02	7	84,000
0725	TRUCK, OVRHD MAINT, AERIAL SERV PLTFM	02	7	84,000
0730	TRUCK, WRECKER, COMMERCIAL/M-SERIES	02	7	84,000
0731	TRUCK, LODR, A-C, W/WINCH/RAMP, HI-LIFT	02	7	84,000
0732	TRUCK, CARGO, HIGHLIFT	02	7	84,000
0733	TRUCK, DUMP, HIGHLIFT	02	7	84,000
0734	TRUCK, CARRIER, PERSONNEL, TRACKED (CONV)	02	8	84,000
0735	TRUCK, REEL HANDLING/TENSIONING, POWERED	02	12	300,000
0736	TRUCK, TARGET RETRIEVING	97	8	84,000
0738	TRUCK, FLATBED, OILFIELD	02	8	84,000
0739	TRUCK, FLATBED, OILFIELD, COMM, 4X2/6X4	02	10	150,000
0740	TRUCK, FLATBED, 4X4	02	7	84,000
0742	TRUCK, TANK, W/O GAGES, GP, 500-999 GAL	02	7	84,000
0743	TRUCK, TANK, AVLUBE OIL DISPEN, 500-599G	02	7	84,000
0744	TRUCK, TANK, AVGAS/JET, 1000-1499 GAL	02	8	84,000
0746	TRUCK, TANK, W/O GAGES, GP, 1000-1499G	02	8	84,000
0750	TRUCK, TANK, AVGAS/JET, 2000-2999 GAL	02	10	150,000
0751	TRUCK, TANK, W/O GAGES, GP, 2000-2999G	02	10	150,000
0752	TRUCK, TANK, AVGAS/JET, 3000-4999 GAL	02	10	150,000
0753	TRUCK, TANK, W/O GAGES, GP, 3000-GAL/UP	02	10	150,000
0754	TRUCK, TANK, FUEL, 2200-GAL, 6X4	02	10	150,000
0756	TRUCK, TANK, AVGAS/JET, 6X4, 5000-GAL/UP	02	12	300,000
0757	TRUCK, TANK, WATER, 1000-1499 GALLONS	02	8	84,000
0758	TRUCK, TANK, WATER, 2000-2999 GALLONS	02	10	150,000

NAVFAC Equipment Code	Description	P-1 Line Item Number	Life Expectancy	
			Years	Miles
0759	TRUCK, TANK, WATER, 3000-GALLONS & UP	02	10	150,000
0760	TRUCK, TANK, HYDROGEN PEROXIDE	97	8	84,000
0761	TRUCK, TANK, PURE WATER, NUCLEAR	97	8	84,000
0800	TRAILER, MAINTENANCE, UTILITY, 2-WHEEL	03	15	
0801	TRAILER, CARGO, 2-WHEEL	03	15	
0802	TRAILER, CARGO, 2-WHEEL	03	15	
0803	TRAILER, LUBRICATION SERVICE	03	15	
0804	TRAILER, CARGO, 2-WHEEL	03	15	
0805	TRAILER, 2 OR 4-WHEEL	03	15	
0806	TRAILER, HELIUM	97	15	
0807	TRAILER, CHASSIS, BOAT	97	15	
0808	TRAILER, MAINTENANCE PLATFORM, HYDRAULIC	03	15	
0809	SEMITRAILER, LOWBED, HYDRYL DROP TABLE	03	15	
0810	SEMITRAILER, STAKE, 1-AXLE	03	15	
0811	SEMITRAILER, VAN, 1-AXLE	03	15	
0812	SEMITRAILER, STAKE, 1 OR 2-AXLE	03	15	
0813	SEMITRAILER, VAN, 1 OR 2-AXLE	03	15	
0814	SEMITRAILER, STAKE, 1 OR 2-AXLE	03	15	
0815	SEMITRAILER, VAN, 2-AXLE	03	15	
0816	SEMITRAILER, STAKE, 2-AXLE	03	15	
0817	SEMITRAILER, VAN, 2-AXLE	03	15	
0818	SEMITRAILER, STAKE, 2-AXLE	03	15	
0819	SEMITRAILER, VAN, REFRIGERATOR, 1-2 AXLE	03	15	
0820	SEMITRAILER, VAN, REFRIGERATOR, 2-AXLE	03	15	
0821	SEMITRAILER, LOWBED, 4-WHEEL	03	15	
0822	SEMITRAILER, LOWBED, 4-WHEEL	03	15	
0823	SEMITRAILER, LOWBED, 4-WHEEL	03	15	
0824	SEMITRAILER, LOWBED, 4-WHEEL	03	15	
0825	SEMITRAILER, LOWBED, 2-AXLE	03	15	
0826	SEMITRAILER, LOWBED, TRUNNION AXLE	03	15	
0827	SEMITRAILER, LOWBED, TRUNNION AXLE	03	15	
0828	SEMITRAILER, LOWBED, TRUNNION AXLE, 8WHL	03	15	
0829	DOLLY, TRAILER CONVERTER	03	15	
0830	TRAILER, STAKE, 1-AXLE	03	15	
0831	TRAILER, VAN, 1-AXLE	03	15	
0833	TRAILER, LOWBED, 4-WHEEL	03	15	
0834	TRAILER, LOWBED, 4-WHEEL	03	15	
0835	TRAILER, LOWBED, 4-WHEEL	03	15	
0839	TRAILER, LOWBED, 8-WHEEL	03	15	
0840	TRAILER, LOWBED, 8-WHEEL	03	15	
0841	TRAILER, STAKE, 2-AXLE	03	15	
0842	TRAILER, BOLSTER, PIPE/POLE	03	15	
0843	TRAILER, CABLE REEL/POLE	03	15	
0844	TRAILER, FILTERING, PORTABLE	03	15	
0845	TRAILER, MAINTENANCE, CABLE SPLICER	03	15	
0846	TRAILER, TANK, LIQUID OXYGEN, 150-500GAL	97	15	
0847	SEMITRLR, VAN, DRESSING/BRIEFING/ALERT	97	15	
0848	TRAILER/SEMITRAILER, DUMP, REFUSE	03	15	

NAVFAC Equipment Code	Description	P-1 Line Item Number	Life Expectancy	
			Years	Miles
0849	TRAILER, OPERATIONAL FLIGHT TRAINER	97	15	
0851	TRAILER, HOUSE/LABORATORY/OFFICE/PHOTO	97	15	
0852	TRAILER, MAINTENANCE, TELEPHONE	03	15	
0853	TRAILER/SEMITRAILER, MISC/EXHIBIT/TRNG	03	15	
0855	TRAILER, DENTAL, PREVENTIVE/OPERATING	03	15	
0856	SEMITRAILER, DENTAL UNIT	03	8	
0857	TRAILER, SHOWER BATH	03	15	
0858	TRAILER, VAN, STOCKROOM	03	15	
0859	TRAILER, PREVENTIVE DENTISTRY TREATMENT	03	15	
0860	TRAILER, AIR CONDITIONER	97	15	
0862	TRAILER/SEMITRAILER, TILTDECK, LOWBED	03	15	
0864	TRAILER, DEHUMIDIFIER	03	15	
0865	TRAILER, WING	97	15	
0868	TRAILER, TARGET RETRIEVING	97	15	
0871	TRAILER, CHASSIS, ELECTRONICS, 1/2-TON	97	15	
0872	TRAILER, CHASSIS, ELECTRONICS, 3/4-TON	97	15	
0873	TRAILER, CHASSIS, ELECTRONICS, 1-3 TON	97	15	
0874	TRAILER, CHASSIS, ELECTRONICS, 4-7 TON	97	15	
0875	TRAILER, CHASSIS, ELECTRONICS, 8-13 TON	97	15	
0876	TRAILER, CHASSIS, ELECTRONICS, 14-TON/UP	97	15	
0878	TRAILER, CHASSIS, ELECT, INSTRMT/DIRECTR	97	15	
0879	TRAILER, ELECTRONICS, ANTENNA	97	15	
0880	TRAILER, TANK, W/O GAGE/PUMP, 2WHL, 400G	03	15	
0881	TRAILER, TNK, W/O GAG/PUMP, 2-4W, 5/600G	03	15	
0882	TRAILER, TNK, W/PUMP, 2-4 WHEEL, 600-GAL	03	15	
0883	TRAILER, TANK, W/O GGS, 2-4 WHL, TO 500G	03	15	
0884	SEMITRAILER, TANK, W/O GAGES, 1000-1999G	03	15	
0885	TRAILER, TANK, PURE WATER, NUCLEAR	97	8	
0886	SEMITRAILER, TANK, W/O GAGES, 2000-2999G	03	15	
0887	SEMITRAILER, TANK, AVGAS/JET, 2000-2999G	03	15	
0888	SEMITRAILER, TANK, W/O GAGES, 3000-3999G	03	15	
0890	SEMITRAILER, TANK, W/O GAGES, 4000-5999G	03	15	
0891	SEMITRAILER, TANK, AVGAS/JET, 4000-G/UP	03	15	
0892	SEMITRLR, TANK, GP, W/O GAGES, 6000-G/UP	03	15	
0893	SEMITRAILER, GUIDED MISSILE TRANSPORT	97	15	
0896	TRAILER, MSL HNDLG, LAUNCH/ERECT/TRANSPT	97	15	
0897	TRAILER, LIQUID OXYGEN VAPORIZING SYSTEM	97	15	
0898	SEMITRAILER, LOWBED, W/GED WINCH ON GSNK	03	15	
0899	TRAILER, TANK, LIQUID NITROGEN	97	15	
0902	MOTORCYCLE, SOLO, 2-WHEEL	02	3	15,000
0903	MOTORCYCLE, PACKAGE DELIVERY, 3-WHEEL	02	3	
0905	SCOOTER, MOTOR, PKG DELIVERY, 3-4 WHEEL	02	3	
0907	SLED, SELF-PROP, SNOWMOB, SKI-STEER, GED	02	5	
0908	GOLF CART (SPECIAL SERVICES ONLY)	97	5	
2110	PLANT, BATCHING, AGGREGATE	04	10	
2111	UNIT, GRADATION CONTROL, AGGREGATE	04	10	
2120	PLANT, BATCHING, CEMENT/CEMENT W/AGGREGT	04	10	
2130	BIN, STORAGE, AGGREGATE, W/WO SCALES	04	12	

NAVFAC Equipment Code	Description	P-1 Line Item Number	Life Expectancy	
		Years	Miles	
2200	CRUSHER, ROCK & SCREEN PLT, PORT, 2-UNIT	04	8	
2210	PLANT, WASHING, AGGREGATE, SAND/GRAVEL	04	6	
2220	FEEDER, AGGREGATE, CONVEYOR OR PORTABLE	04	6	
2225	FEEDER, FINES, BITUMINOUS MIX	04	6	
2300	FINISHER, PAVING, ASPHALT	04	8	
2325	PAVER, CURB	04	8	
2340	GRINDER, PAVEMENT, CONCRETE, SELF-POWER	04	4	
2410	MIXER, ASPHALT PLANT	04	8	
2415	MIXER, ROAD MATERIAL, ASPHALT, S-P/TOWED	04	6	
2416	MIXER-SPREADER, BITUM SLURRY, TRUCK MTD	04	6	
2417	MIXER, ROAD MATRL STABILIZER, S-P/TOWED	04	8	
2420	MIXER, TRANSIT, CONCRETE, TRUCK MOUNTED	04	6	
2425	PLANT, CONCRETE, MIX/BATCH, COMPLT, TRLR	04	10	
2430	MIXER, CONCRETE, PORTABLE, UNDER 3 1/2-S	04	8	
2431	MIXER, CONCRETE, PORTABLE 3 1/2-S(CU FT)	04	8	
2432	MIXER, CONCRETE, PORTABLE, 6-7 S (CU FT)	04	8	
2433	MIXER, CONCRETE, PORTABLE, 10-11 S (CFT)	04	8	
2434	MIXER, CONCRETE, PORTABLE, 14-16 S (CFT)	04	8	
2462	SPRAYER/SANDBLASER, CONCRETE, W/WO MXR	04	6	
2470	SAW, CONCRETE, SELF-POWERED	04	4	
2520	DISTRIBUTOR, ASPHALT, TRUCK/TRAILER MTD	04	8	
2521	DISTRIBUTOR, WATER, TRUCK OR TRAILER MTD	04	10	
2522	BUGGY, CONCRETE, SELF-PROPELLED	04	4	
2530	SPREADER, ROCK AND AGGREGATE, TOWED	04	10	
2535	SPREADER, AGGREGATE, SELF-PROPELLED, PRT	04	10	
2540	SPREADER, LOOSE MATERIAL, TOWED	04	10	
2542	SPREADER, CEMENT/LIME, SELF-PROPELLED	04	10	
2610	CONVEYOR, AGGREGATE, BELT OR TROUGH	04	10	
2615	ELEVATOR, BUCKET, HOT OR COLD AGGREGATE	04	6	
2620	PUMP, CONCRETE	04	6	
2625	BOOM, WITH SLICK LINE, TRUCK MOUNTED	04	8	
2720	DRYER, AGGREGATE, ASPHALT PLANT	04	10	
2730	BOILER, ASPHALT HTR, TANK CAR, 28-42 HP	04	12	
2732	BOILER, STEAM, PORTABLE, 300-HP/UP	99	6	
2735	HEATER, ASPHALT TOOL, TRAILER MOUNTED	04	8	
2740	KETTLE, HEATING, BITUMEN, SKID/TRLR MTD	04	8	
2745	HEATER-PLANER, ROAD SURFACE, SELF-PROPEL	04	8	
2750	TANK, ASPHALT STORAGE, TRUCK OR TRLR MTD	04	12	
2760	KETTLE, HEATING, RUBBERIZED JOINT SEALER	04	6	
2840	GROUTER, MUD JACK	04	6	
3100	COMPRESSOR, AIR, PORTABLE, 60-104 CFM	05	6	
3110	COMPRESSOR, AIR, PORTABLE, 105-125 CFM	05	6	
3111	TRACTOR-AIR COMPRESSOR, PRT, 125-CFM	05	6	
3130	COMPRESSOR, AIR, PORTABLE, 210-CFM	05	8	
3135	COMPRESSOR, AIR, PORTABLE, 250-CFM	05	8	
3150	COMPRESSOR, AIR, PORTABLE, 315-CFM	05	8	
3155	COMPRESSOR, AIR, PORTABLE, 365-CFM	05	8	
3160	COMPRESSOR, AIR, PORTABLE, 500-CFM	05	8	

Equipment Code	Description	P-1	Life Expectancy	
		Line Item Number	Years	Miles
3165	COMPRESSOR, AIR, PORTABLE, 600-CFM/OVER	05	8	
3175	COMPRESSOR, HELIUM, PORTABLE, SKID/TRLR	97	8	
3530	DRILL, PNEUMATIC DRIFT, WAGON, AUTO FEED	05	8	
3531	DRILL, CORE, SKID/TRAILER/TRUCK MOUNTED	05	6	
3532	DRILL, PNEUMATIC DRIFT, CRAWLER MTD	05	6	
3630	DRIVER, PILE, SELF-CONTAINED	05	10	
3710	AUGER, EARTH, VER/HOR, SKD/TRLR/TRK/TRKD	05	8	
3720	DRILL, WELL, ROTARY/PERCUSSION	05	7	
4230	CRANE, CRWLR, DED, 7-10 TON, 3/4CY	06	10	
4240	CRANE, CRWLR, DED, 20-30 TON, 1 1/2CY	06	10	
4250	CRANE, CRWLR, DED, 30-40T, 1-3/4-2CY	06	10	
4260	CRANE, CRWLR, DED, 45-60 TON, 2 1/2CY	06	12	
4270	CRANE, CRWLR, DED, 65-75 TON, 3-4CY	06	12	
4305	CABLE LAYER, UNDERGROUND, TOWED	06	12	
4310	DITCHER, WHEEL/LADDER, WHEEL/CRAWLER MTD	06	7	
4320	ROOTER, ROAD; HARROW, DISC, TOWED	06	8	
4330	EXCAVATOR, MULTIPUR, W/TEL BOOM, TRK MTD	06	10	
4340	EXCAVATOR, HYDRAUL BACKHOE, CRAWLER MTD	06	10	
4410	GRADER, ROAD, TOWED	06	8	
4420	GRADER, ROAD, MOTORIZED, GED/DED	06	8	
4530	LOADER, SCOOP, FULL-TRACK, SHOVEL DOZER	06	7	
4531	LOADER, SCOOP, WHEEL MOUNTED	06	7	
4540	LOADER, SNOW, BELT/BUCKET, CRWLR/WHL MTD	06	10	
4610	ROLLER, WOBBLE WHEEL, PNEUMATIC TIRE	06	8	
4615	ROLLER, OSCILLATING, SELF-PROPELLED, PRT	06	7	
4620	ROLLER, SHEEPSFOOT, TAMMING, TOWED	06	10	
4621	ROLLER, GRID, TOWED	06	12	
4622	ROLLER, GRID/SEGMENTED, SELF-PROPELLED	06	12	
4625	COMPACTOR, VIBRATOR, EARTH OR AGGREGATE	06	4	
4630	ROLLER, ROAD, TANDEM, S-P, ALL SIZES	06	10	
4635	ROLLER, ROAD, VIBRATING, S-P, ALL SIZES	06	10	
4640	ROLLER, ROAD, 3-WHEEL, S-P, ALL SIZES	06	10	
4710	SCRAPER, CARRYALL, CABL/HYD, TWD, 3-5 CY	06	7	
4730	SCRAPER, CARRYALL, CABLE/HYD, TWD, 12-CY	06	7	
4731	SCRAPER, CARRYALL, 2-WH UNV HCH, 14-18CY	06	7	
4750	TRACT-SCRPR, INTG, S-P, 1-2 ENG, 15-24CY	06	7	
4760	TRUCK, DUMP, OFF-HIGHWAY	06	8	
4770	TRAILER, DUMP, EARTH-MOVE, WHL/CRWLR MTD	06	7	
4805	TRACTOR, 2-WHL, W/DUMP TRLR, 15-30 TON	06	7	
4809	TRACTOR, CRAWLER, GED/DED, TO 10 DBHP	06	6	
4810	TRACTOR, CRAWLER, GED/DED, 10-34 DBHP	06	8	
4820	TRACTOR, CRAWLER, GED/DED, 35-49 DBHP	06	8	
4830	TRACTOR, CRAWLER, GED/DED, 50-74 DBHP	06	8	
4840	TRACTOR, CRAWLER, GED/DED, 75-109 DBHP	06	10	
4850	TRACTOR, CRAWLER, GED/DED, 110-179 DBHP	06	10	
4851	TRACTOR, CRAWLER, GED/DED, 180-DBHP & UP	06	10	
4860	TRACTOR, WHEEL, PRT, GARDEN, TO 14 HP	06	4	
4865	TRACTOR, WITH AERIAL SERVICING PLATFORM	06	7	

NAVFAC Equipment Code	Description	P-1	Life Expectancy	
		Line Item Number	Years	Miles
4872	TRACTOR, WHL, PRT, IND, GED, 9-19 DBHP	06	6	
4873	TRACTOR, WHL, PRT, IND, GED, 20-29 DBHP	06	6	
4874	TRACTOR, WHL, PRT, IND, GED, 30-39 DBHP	06	6	
4875	TRACTOR, WHL, PRT, IND, GED, 40-49 DBHP	06	6	
4876	TRACTOR, WHL, PRT, IND, GED, MIN 50-DBHP	06	6	
4877	TRACTOR, WHL, IND, W/AMMO MOWER, 30-DBHP	06	6	
4878	TRACTOR, WHL, IND, GND SUP EQUIP, AIRFLD	06	6	
4891	TRACTOR, WHEEL, INDUST, 7800-14000 PDBP	06	7	
4892	TRACTOR, WHEEL, INDUST, 14001-20000 PDBP	06	7	
4893	TRACTOR, WHEEL, INDUST, 20001-27000 PDBP	06	7	
4894	TRACTOR, WHEEL, INDUST, 27001 PDBP & UP	06	7	
5110	FLOODLIGHT, ELEC, TRUCK/TRLR MTD	07	8	
5113	FLOODLIGHT, AIRFIELD, TRAILER	07	6	
5120	GENERATOR, PORTABLE, GED/DED, 5-9 KW	07	8	
5121	GENERATOR, PORTABLE, GED/DED, 10-15 KW	07	8	
5122	GENERATOR, PORTABLE, GED/DED, 16-30 KW	07	10	
5123	GENERATOR, PORTABLE, GED/DED, 31-59 KW	07	10	
5124	GENERATOR, PORTABLE, GED/DED, 60-100 KW	07	10	
5125	GENERATOR, PORTABLE, GED/DED, 101-150 KW	99	10	
5126	GENERATOR, PORTABLE, GED/DED, 251-499 KW	99	15	
5127	GENERATOR, PORTABLE, GTE/DED, 500-750 KW	99	10	
5128	GENERATOR, PORTABLE, GED/DED, 151-250 KW	99	10	
5130	GENERATOR, PORTABLE, GTE/DED, 751-KW/UP	99	20	
5135	GENERATOR, PORTABLE, ELECTRONIC, 400-HZ	97	10	
5150	SUBSTATION, MOBILE, W/TRANSF & FEED SECT	99	12	
5155	TRANSFORMER, MOBILE, 750-KVA/UP	99	20	
5157	DISTRIBUTION SYSTEM, POWER, TRAILER MTD	99	20	
5160	LUBRICATOR, POWER OPERATED, SKID MTD	08	6	
5170	WELDER, ARC, ELEC, GED/DED, SKID/TRLR MT	08	6	
5171	WELDER, ARC, ELECTRIC, SELF-PROPELLED	08	6	
5220	PUMP, CENTRIFUGAL, 4-INCH OR GREATER	08	6	
5230	PUMP, SUMP, PORTABLE, GED/DED	08	6	
5240	PUMP, ROTARY, PORTABLE, GED/DED	08	6	
5300	DISTRIBUTOR, BITUMINOUS MATRL, TANKLESS	08	6	
5405	CLEANER, VAC, LEAF/LITTER, TRK/TRLR MTD	08	6	
5408	CLEANER, VACUUM, AIRFIELD, SELF-PROP	08	6	
5409	CLEANER, BASIN/MANHOLE, VAC/HYD, TRK MTD	08	6	
5410	CLEANER, STEAM, HI-PRESS, SKID/TRLR MTD	08	4	
5411	CLEANER, JOINT, PAVING	08	6	
5412	CLEANER, PIPE/SEWER, AUGER/CABLE, TRLR	08	6	
5413	CLEANER, SCRAPER, PORTABLE	08	4	
5414	CLEANER, SEPTIC TANK/CESSPOOL, TRUCK MTD	08	6	
5415	CLEANER, BOMB, STEAM, TRLR MTD	97	4	
5416	CLEANER, PIPE/SEWER, WATER JET, TRK MTD	08	6	
5418	CLEANER, SANDBLASTING, PORTABLE	08	6	
5420	SPRAYER, DECONTAM, GED, TRK/SKD/TRL MTD	98	8	
5421	SPRAYER/DUSTER, PESTICIDE, PORTABLE, GED	08	5	
5428	WASHER, POWERLINE INSULATOR, TRK/TRL MTD	08	6	

NAVFAC Equipment Code	Description	P-1 Line Item Number	Life Expectancy	
			Years	Miles
5430	MARKER, TRAFFIC LINE, ROAD, WHL MTD, TWD	08	8	
5435	MARKER, TRAFFIC LINE, ROAD, SELF-POWERED	08	6	
5440	POWER UNIT, TRAILER MOUNTED	08	8	
5441	BURNER, WEED, GAS FIRED, TRAILER MOUNTED	08	10	
5450	DISTILLER, WATER, SKID MTD, GED/DED/EMD	99	8	
5455	PURIFIER, WATER, SKID/TRUCK MTD	08	8	
5498	LAUNDRY, TRAILER MOUNTED	08	6	
5500	UNIT, FUEL SERV, A-C, TRLR MTD, 600-GPM	08	8	
5515	TONGS, PIPE, POWER OPER, WHL/SKID MTD	08	8	
5525	REEL, HOSE, FUELING, AMPHIBIOUS	08	8	
5530	AIR CONDITIONER, MOBL, SKID, GED/DED/EMD	99	7	
5621	MOWER, LAWN, ROTARY FLAT KNIFE, TOWED	08	4	
5628	CUTTER, STUMP, WHEEL-MOUNTED, TOWED	08	6	
5630	MOWER, LAWN, REEL, SELF-PROPEL, 30-IN/UP	08	4	
5635	MULCHER, SEED/FERTILIZ, SKD/TRK/TRLR MTD	08	8	
5642	SHREDDER, BRUSH DISPOSER, GED, TRLR MTD	08	6	
5643	SHREDDER, SOIL PULVERIZER/MIXER, TRLR MT	08	4	
5650	MOWER, HAMMERKNIFE OR SICKLEBAR, TOWED	08	4	
5660	PLATFORM, MAINT, HI-LIFT, S-P, TELE BOOM	08	7	
5700	SWEeper, ROTARY, S-P, WHSE/SIDEWALK/ROOF	08	4	
5701	SWEeper, SHIPDECK, IND, W/SCRUBBER, DED	08	6	
5710	SWEeper, STREET, MAGNETIC, S-P, OR TOWED	08	7	
5720	SWEeper, ROTARY, STREET, PICKUP, S-P	08	7	
5730	SWEeper, LAWN, SELF-PROPELLED OR TOWED	08	10	
5740	SWEeper, STREET, REV BROOM, NON-PU, TWD	08	7	
5745	SWEeper, ROTA, TWD, SNOW, AIRBLAST, AFLD	08	7	
5750	SNOWPLow, S-C, ROTARY/ROTO-WING, TRK MTD	08	7	
5755	SNOWPLow, S-C, DISPLACEMENT, TRK MTD	08	7	
5757	SNOWPLow, ROLLOVER, W/WO SANDER, TRK MTD	08	7	
5790	SANDER, SELF-CONTAINED, STREET, TRK MTD	08	10	
5795	SANDER, STREET, FOR TRK MOUNTING/TOWING	08	8	
5797	SCRUBBER, SHIPDECK, SELF-PROPELLED, DED	08	6	
5820	TRUCK, REFUSE COLLECTION, COMPACTION	02	8	
5830	TRUCK, MAT HNDLG, HOIST/HAUL, 2-12 CU YD	02	8	
5831	TRUCK, MAT HNDLG, HOIST, FORKLIFT, G/DED	02	7	
5833	TRUCK, MAT HNDLG, HOIST/HAUL TO 45-CU YD	02	7	
5835	TRUCK, REF COLL, COMPACT, W/HOIST, 24-CY	02	8	
5840	SEMITRAILER/TRAILER, REFUSE COLLECTION	03	12	
5842	SEMITRAILER, REFUSE COLLECT, COMPACTION	03	12	
5900	SHOP, WOODWORKING, MOBILE, TRLR MTD	08	15	
5910	SHOP, MACHINE, MOBILE, TRAILER MOUNTED	08	15	
5912	SHOP, TRADESMAN, MOBILE, TRAILER MOUNTED	08	10	
5920	SHOP, MACHINE, MOBILE, TRUCK MOUNTED	08	15	
6100	CAR, RAILROAD, MISCELLANEOUS SERVICE	31	28	
6110	CAR, RAILROAD, BOX	31	28	
6120	CAR, RAILROAD, FLAT, STANDARD	31	28	
6130	CAR, RAILROAD, GONDOLA, SOLID BOTTOM	31	25	
6140	CAR, RAILROAD, HOPPER, SIDE/BOTTOM DUMP	31	25	

NAVFAC Equipment Code	Description	P-1	Life Expectancy	
		Line Item Number	Years	Miles
6150	CAR, RAILROAD, DUMP, AIR/MANUALLY OPER	31	25	
6160	CAR, RAILROAD, FLAT, DEPRESSED CENTER	31	25	
6210	CAR, RAILROAD, MOTOR, MAINTENANCE-OFF-WAY	31	15	
6220	CAR, RAILROAD, INSPECTION/MAINTENANCE	31	15	
6222	TAMPER, SELF-PROPELLED, RR, TIE/BALLAST	08	12	
6230	CAR, RAILROAD, MOTOR, MAINT/SECTION GANG	31	15	
6240	CAR SPOTTER, ROAD-RAILER, PRT, SELF-PROP	31	15	
6250	CAR, RAILROAD, AUTORAILER	31	15	
6310	HANDCAR, RAILROAD	31	15	
6320	PUSHCAR, RAILROAD	31	15	
6340	CAR, RAILROAD, CABOOSE	31	28	
6370	CAR, RAILROAD, COACH	31	28	
6400	CAR, RAILROAD, TANK, GENERAL PURPOSE	31	28	
6520	LOCOMOTIVE, RAILROAD, 21-39 TON	31	25	
6530	LOCOMOTIVE, RAILROAD, 40-59 TON	31	25	
6540	LOCOMOTIVE, RAILROAD, 60-80 TON	31	25	
6550	LOCOMOTIVE, RAILROAD, 81-100 TON	31	25	
6560	LOCOMOTIVE, RAILROAD, 101-TON/UP	31	25	
6580	LOCOMOTIVE, RAILROAD, MINE	31	25	
6600	EQUIPMENT, MAINTENANCE, RAILROAD, MISC	08	12	
6700	CAR, RAILROAD, BATTERY CHARGING, GED/DED	99	25	
7100	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE, MISC	09	7	
7102	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE	09	7	
7103	TRUCK, FIREFIGHTING, HOSE WAGON	09	10	
7105	TRUCK, FIREFIGHTING, TANK, FOAM/WATER	09	12	
7155	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE, CO ₂	09	8	
7160	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE	09	8	
7165	TRUCK, FIREFIGHT, CRASH, FOAM, SMALL	09	8	
7175	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE	09	8	
7180	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE	09	12	
7190	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE	09	8	
7195	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE	09	8	
7200	TRAILER, FIREFIGHTING, PUMP, 500-GPM	09	8	
7225	AGENT RESUPPLIER, TRUCK/TRLR MTD	09	8	
7230	TRAILER, FOAMER/AGENT RESUPPLY/FIREFIGHT	09	12	
7300	TRUCK, FIREFIGHTING, MISC MOUNTED EQUIP	09	12	
7310	TRUCK, FIREFIGHTING, PUMPER, 500-GPM	09	12	
7320	TRUCK, FIREFIGHTING, PUMPER, 750-GPM	09	12	
7321	TRUCK, FIREFIGHTING, STRUCTURAL, PUMPER	09	12	
7330	TRUCK, FIREFIGHTING, FOAM GENERATING	09	12	
7340	TRUCK, FIREFIGHTING, BRUSH/GRASS, W/TANK	09	12	
7341	TRUCK, FIREFIGHTING, BRUSH/GRASS, ATTACK	09	12	
7400	TRUCK, FIREFIGHTING, AERIAL LADDER	09	15	
7500	TRAILER, GENERATOR, SELF-POWERED, FOAM	09	10	
7501	PUMP, FIREFIGHTING, PORTABLE, 60-1000GPM	09	10	
8160	CRANE, LANDING CRAFT, WHEEL MOUNTED	10	8	
8200	CRANE, TRK MTD, 2-ENG, PRT, 5-14 T CAPY	10	8	
8205	CRANE, TRK MTD, 2-ENG, PRT, 15-24 T CAPY	10	10	

NAVFAC Equipment Code	Description	P-1 Line Item Number	Life Expectancy	
			Years	Miles
8210	CRANE, TRK MTD, 2-ENG, PRT, 25-30 T CAPY	10	10	
8215	CRANE, TRK MTD, 2-ENG, PRT, 31-40 T CAPY	10	10	
8218	CRANE, TRK MTD, 2-ENG, PRT, 41-50 T CAPY	10	10	
8219	CRANE, TRK MTD, 2-ENG, PRT, 51-T/UP CAPY	10	10	
8220	CRANE, CRUISER, 1-ENG, PRT, 5-10 T CAPY	10	10	
8230	CRANE, CRUISER, 1-ENG, PRT, 11-30 T CAPY	10	12	
8232	CRANE, CRUISER, 1-ENG, PRT, 31-40 T CAPY	10	12	
8233	CRANE, CRUISER, 1-ENG, PRT, 41-50 T CAPY	10	12	
8235	CRANE, CRUISER, 1-ENG, PRT, 60-80 T CAPY	10	12	
8240	CRANE, TRUCK, CRASH, AIRCRAFT	10	8	
8241	CRANE, CRASH, AC, NONREVOLV, S-P, SHIPBD	10	10	
8242	CRANE, CRASH, NONREVOLV, S-P, INTEGRAL	10	10	
8243	CRANE, CRASH, HELICOPTER, WHL TRACTR MTD	10	10	
8244	CRANE, CRASH, AC, W/TELE BOOM, SHBD, WHL	10	10	
8246	CRANE, TRK MTD, HYD BOOM, 20-30 TON CAPY	10	10	
8249	CRANE, TRK MTD, HYD BOOM, 51-TON/UP	10	10	
8250	CRANE, TORPEDO, PRT, TRUCK/TRAILER MTD	10	8	
8252	CRANE, CARRIER, TORPEDO HANDLING, DED	10	10	
8253	CRANE, HYD, SWING CAB, WHL, 4X4, 15-T/UP	10	10	
8254	CRANE, HYD BOOM, WHL MTD, 4X4, 5-35 TON	10	10	
8260	TRUCK, MISSILE HNDLG, PRT, MOBILE LIFT	10	8	
8410	CRANE, RAILROAD, LOCO, 15-30 TON CAPY	10	25	
8420	CRANE, RAILROAD, LOCO, 31-50 TON CAPY	10	25	
8430	CRANE, RR, LOCO WRECKING, 51-200 TON CAP	10	25	
8700	WINCH, DRUM, POWER OPERATED, GED/DED	97	10	
8800	UNIT, PROPELLING, MARINE, OUTBD, GED/DED	10	7	
8911	OIL SKIM SYS, SMALL, PORT, 50GAL STORAGE	96	5	
8912	OIL SKIM SYS, MEDIUM, TRLR MTD, FLOAT HD	96	10	
8916	OIL SKIM SYS, LARGE, FLOATING, SELF-PROP	96	10	
8935	OIL/WATER SEPARATOR SYS, RAFT SVC, 6000G	96	10	

COMPUTATION FACTORS FOR USE IN EXTENSIVE REPAIR DETERMINATIONS - AGE IN YEARS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
3YR	75	49	20																						
4YR	75	57	38	20																					
5YR	75	61	47	33	20																				
6YR	75	64	53	42	31	20																			
7YR	75	65	56	47	38	29	20																		
8YR	75	67	59	51	43	35	27	20																	
9YR	75	68	61	54	47	40	33	26	20																
10YR	75	69	63	57	51	45	39	33	24	20															
11YR	75	70	65	60	55	50	44	36	32	26	20														
12YR	75	70	65	60	55	50	45	40	35	30	25	20													
13YR	75	70	65	60	55	50	45	40	36	32	28	24	20												
14YR	75	71	67	63	59	55	51	47	43	38	32	28	24	20											
15YR	75	71	67	63	59	55	51	47	43	39	35	31	26	23	20										
16YR	75	71	67	63	59	55	51	47	43	39	35	32	29	26	23	20									
17YR	75	71	67	63	59	55	51	47	44	41	38	35	32	29	26	23	20								
18YR	75	71	67	63	59	56	53	50	47	44	41	38	35	32	29	26	23	20							
19YR	75	72	69	66	63	60	57	54	51	48	45	42	39	36	33	30	27	24	20						
20YR	75	72	69	66	63	60	57	54	51	48	45	42	39	36	33	30	27	24	22	20					
21YR	75	72	69	66	63	60	57	54	51	48	45	42	39	36	33	30	28	26	24	22	20				
22YR	75	72	69	66	63	60	57	54	51	48	45	42	39	36	34	32	30	28	26	24	22	20			
23YR	75	72	69	66	63	60	57	54	51	48	45	42	40	38	36	34	32	30	28	26	24	22	20		
24YR	75	72	69	66	63	60	57	54	51	48	46	44	42	40	38	36	34	32	30	28	26	24	22	20	
25YR	75	72	69	66	63	60	57	54	52	50	48	46	44	42	40	38	36	34	32	30	28	26	24	22	20

NOTE: The figures in the above table are to be used as a percentage of equipment replacement cost in determining the maximum one-time repair for Alpha Groups A-P and X and equal/similar equipment in Alpha Groups Q and Z.

APPENDIX D. LIST OF FAMILY EQUIPMENT ITEMS
OF CIVIL ENGINEERING SUPPORT EQUIPMENT
(AUTOMOTIVE VEHICLES, CONSTRUCTION EQUIPMENT,
MOBILE CRANES, AND SPECIALIZED MOBILE EQUIPMENT)

1. Department of Defense policy provides that normally all vehicles provided for administrative use will be of commercial design. Experience shows that most tasks at naval shore activities can be effectively and economically satisfied with standard equipment that is commercially available. This concept reduces operating costs and simplifies maintenance support.
2. The listing which follows is organized in groups of equipment by P-1 Line Item Number. The technical data included in the notes following each P-1 Line Item Number group are to facilitate the selection and procurement of the proper equipment for the activity mission. The following systematic approach is suggested in the equipment selection process:
 - a. List, analyze, and catalog all operations required to be performed by the equipment being considered.
 - b. List all other equipment and operations affecting or affected by the availability of the equipment in question.
 - c. Establish the minimum number of units required by type and size. Give consideration to multipurpose capabilities of equipment and work areas where one large size unit can supplant a more costly group of smaller items.
 - d. Review the list of Family of Equipment Items. Compare the inventory of equipment on board with an optimum inventory which could be established. Use Family of Equipment Items where applicable. Where nonfamily equipment can offer tangible advantages, document these advantages and request the most efficient equipment.
 - e. Build consistently toward an optimum inventory from the Family of Equipment described in this Appendix.
 - f. Refer to the numbered notes which are at the end of each P1-Line Item section. Applicable note numbers appear with each pertinent item, equipment description, etc., with the symbol _ setting off the number(s).

P-1 LINE ITEM 01
PASSENGER-CARRYING VEHICLES

NAVFAC Equip. Code
Type Designator

Item Description

0063-01	1/ Bus, Motor, BOC, 36-passenger, DED, 4x2, w/auto trans, pwr steering
0103-01	Auto, Sedan, Subcompact, 4 passenger, 4 cylinder 4 door
0103-02	Auto, Sedan, Subcompact, 4 passenger, 4 cylinder 4 door w/air cond.
0104-01	Auto, Sedan, Compact, 5-passenger, 4-door, 4x2, w/auto trans
0104-02	Auto, Sedan, Compact, 5-passenger, 4-door, 4x2, w/air cond, auto trans
0114-01	Auto, Sedan, Compact, Law Enforcement, 5-pass, 4-door, 4x2, w/auto trans
0114-02	Auto, Sedan, Compact, Law Enforcement, 5-pass, 4-door, 4x2, w/air cond, auto trans
0210-01	Auto, Station Wgn, Compact, 5-passenger, 4-door, 4x2, w/auto trans
0210-02	Auto, Station Wgn, Compact, 5-passenger, 4-door, 4x2, w/air cond, auto trans

P-1 LINE ITEM 02
 TRUCKS 1/

<u>NAVFAC Equip. Code Type Designator</u>	<u>Item Description</u>	<u>GW Rating 1/ (lbs.)</u>	<u>Approx. Payload (lbs.)</u>
0305-01	Truck, Utility, Commercial, GED, 4x4, w/ metal or fiberglass top, H-D suspension (similar to AMC "Jeep," IHC "Scout" or Ford "Bronco")	3,500	500
0313-01	Truck, Cargo, Pickup, GED, 4x2	4,500	1,000
0316-01	Truck, Cargo, Pickup, GED, 4x4, w/H-D suspension	6,000	1,500
0319-01	Truck, Cargo, Pickup, Compact, 4x2,	3,800	1,000
0320-01	Truck, Multistop, Forward Control, GED, 4x2, Aircraft Maintenance	7,500	2,000
0329-01	Truck, Panel, Forward Control, GED, 4x2	4,700	1,000
0330-01	Truck, Carryall, Fwd Control, 8-pas- senger, GED, 4x2, w/seats & windows	6,000	1,500
0330-02	Truck, Carryall, Fwd Control, 12-pas- senger, GED, 4x2, w/seats & windows	7,500	
0330-03	Truck, Carryall, Fwd Control, 15-pas- senger, GED, 4x2, w/seats & windows	8,510	
0332-01	Truck, Ambulance, Field, Commercial, 4-litter, GED, 4x4, w/60" interior height, patients' vacuum, air-condi- tioning and heating systems	10,500	2,000
0333-01	Truck, Van, Ambulance Conversion, Com- mercial, (2-litter/2-attendant), GED, 4x2, forward control, w/auto trans, 60" interior height, patients' oxygen, vacuum, air-conditioning and heating systems	7,500	1,400
0336-01	Truck, Panel, Paddy Wagon, Fwd Con- trol, GED, 4x2, Shore Patrol, Commercial white color, w/auto trans, rear bumper step, roof vent, roof-mtd red warning light, security partition w/emergency escape hatch, side benches, expanded metal screen over rear compartment glass areas	6,200	1,000

0342-01	Truck, Cargo, Pickup, GED, 4x2	6,500	2,000
0342-02	Truck, Cargo, Pickup, GED, 4x2 w/800-lb capacity hydraulic tailgate	6,500	1,800
0343-01	<u>3/</u> Truck, Stake, GED, 4x2, body approx. 90" long x 78" wide	8,500	2,000
0343-02	<u>3/</u> Truck, Stake, GED, 4x2, body approx. 90" long x 78" wide. w/800-lb capacity hydraulic tailgate.	8,500	1,800
0345-01	Truck, Multistop Delivery, GED, 4x2, w/auto trans	7,500	2,000
0348-01	Truck, Cargo, Pickup, GED, 4x4, w/H-D suspension	7,000	2,000
0355-01	Truck, Cargo, Pickup, 6M, GED, 4x4, w/4-door cab, H-D suspension	8,500	2,000
0357-01	Truck, Cargo, Pickup, 4x2, GED, w/4 door 6 man cab	8,500	2,000
0362-01	Truck, Van, Forward Control, HI-volume body	8,500	2,500
0420-01	Truck, Multistop Delivery, GED, 4x2, w/auto trans	13,000	6,500
0443-01	<u>4/</u> Truck, Dump, 3 cu yd, GED, 4x2, w/ hydraulic hoisted dump body, pwr steering, cab protector, double-acting tailgate, mechanical hoist safety lock	16,000	6,500
0445-01	<u>3/</u> & <u>5/</u> Truck, Stake, GED, 4x2, w/12' stake body, pwr steering	16,000	9,500
0445-02	<u>3/</u> & <u>5/</u> Truck, Stake, GED, 4x2, w/12' stake body, pwr steering, 2,000-lb capacity hydraulic tailgate	16,000	9,000
0449-01	Truck, Van, GED, 4x2, w/12' aluminum body, roll-up rear door, pwr steering. Inside body dimensions approx. 89" wide x 78" high	16,000	8,000
0449-02	Truck, Van, GED, 4x2, w/12' aluminum body, roll-up rear door, pwr steering, 2,000-lb capacity fold-under hydraulic tailgate. Inside body dimensions approx. 89" wide x 78" high	16,000	7,500

0450-01	Truck, Van, Refrigerator, GED, 4x2, w/11' aluminum body, pwr steering. Inside body dimensions 82" wide x 72" high	16,000	6,500
0602-01	<u>4/</u> Truck, Dump, 6 cu yd, DED, 4x2, w/hydraulic hoisted dump body, pwr steering, cab protector, double-acting tailgate, mechanical hoist safety lock	24,000	12,000
0603-01	<u>3/</u> & <u>5/</u> Truck, Stake, DED, 4x2, w/16' stake body, pwr steering	24,000	14,000
0603-02	<u>3/</u> & <u>5/</u> Truck, Stake, DED, 4x2, w/16' stake body, pwr steering, 2,000-lb capacity hydraulic tailgate	24,000	13,500
0605-01	Truck, Van, DED, 4x2, w/16' alumini- num body, roll-up rear door, pwr steering. Inside body dimensions approx. 89" wide x 78" high	24,000	12,000
0605-02	Truck, Van, DED, 4x2, w/16' alumini- num body, roll-up rear door, pwr steering. 2,000-lb capacity fold- under hydraulic tailgate	24,000	11,500
0614-01	<u>6/</u> Truck, Tractor, DED, 4x2, 55,000 GCW, w/pwr steering, 10 forward speeds, fore-and-aft rocking fifth wheel, 49" <u>+ 1"</u> fifth wheel height, air brakes	32,000	-----

0630-01	<u>6/</u> Truck Tractor, DED, 6x4, 65,000 GCW, w/pwr steering, 10 forward speeds, fore-and-aft rocking fifth wheel, 53" fifth wheel height, air brakes	39,500	-----
0704-01	<u>7/</u> Truck, Ammunition Handling, stake and platform, 12'-body, DED, 4x2, with hydraulic crane mounted rear of cab having a capacity of 4,000 lbs @ 10' radius and 2,000 lbs @ 18' working radius	24,000	-----
0707-01	<u>8/</u> Truck, Platform, airfield flight line servicing, GED, 4x2, w/remova- ble cab, and 1,000-lb capacity rear cargo bed	2,500	1,000
0707-02	<u>9/</u> Truck, Platform, airfield flight line servicing, EMD, 4x2, w/remova- ble cab, and 2,000-lb capacity rear cargo bed	3,350	2,000
0708-01	Truck, Platform, Utility, 3 or 4- wheel, 18 HP, GED, 1,000-lb payload capacity	-----	-----
0708-02	Truck, Platform, Utility, 3 or 4- wheel, 24 to 36-volt, EMD, 250 to 500-lb payload capacity	-----	-----
0709-01	<u>10/</u> & <u>21/</u> Truck, Field Lubricating & Fuel Servicing, GED, 4x2, w/com- plete fuel servicing equipment, power steering	19,000	-----
0722-01	<u>21/</u> Truck, Maintenance, Utility, GED, 4x2, w/8' center load compartment body, curb & street-side cabinets, telescoping roof enclosure.	5,800	1,500
0722-03	<u>2/</u> Truck, Panel, Forward Control, Utility, GED, 4x2, w/utility cabinets on both sides of cargo space, "with ladder racks and conduit holder"	6,200	1,300
0722-05	Truck, Maintenance, Utility, Compact chassis, 4x2, GED, w/7' center load compartment, curb and street side cabinets	4,000	1,000

0725-01	Truck, Overhead Maintenance, Aerial Servicing Platform, DED, 4x2, w/pwr steering, two-man 500-lb capacity insulated basket, 360° rotation two-segment articulated boom (45' vertical reach & 28' horizontal reach), maintenance body including street- & curb-side cabinets	24,000	-----
0725-02	Truck, Overhead Maintenance, Aerial Servicing, Hydraulic Extension Ladder, GED, 4x2, w/30' ground-to-self-leveling platform height, 360° rotation, maintenance utility body	10,000	-----
0730-01	<u>11/</u> Truck, Wrecker, DED, 4x2, w/two 12-ton capacity swinging booms, pwr steering, 5-speed trans & 2-speed rear axle	24,000	-----
0730-02	<u>11/</u> Truck, Wrecker, GED, 4x2, w/two 5-ton capacity swinging booms, pwr steering, 4-speed transmission	16,000	-----
0731-01	<u>12/</u> Truck, Loader, Aircraft Cargo, Hi-lift Platform, DED, 6x4, chassis and cab, with a hydraulically operated high-lift body of 9-ton capacity and 13' vertical lift height; equipped with removable stake sides, steel front, tailgate, and access ladder	39,500	-----
0731-02	<u>12/</u> Truck, Loader, Aircraft Cargo, Hi-lift Platform, GED, 4x2, commercial cab and chassis with a hydraulic lift body of 2-ton capacity and 10' vertical lift height; equipped with removable expanded metal front and side panels	14,000	-----
0743-01	<u>13/</u> & <u>21/</u> Truck, Tank, Aviation Lubricating Oil Dispensing, 500-gallon capacity, GED, 4x2, w/related pumping equipment accessories and aviation lube oil tank heating system	16,000	-----

0746-01	<u>21/</u> Truck, Tank, Fuel Servicing, General Purpose, 1,000 gallon, GED, 4x2, w/pwr steering, 5-speed trans, PTO-driven pump & meter, single compartment stainless steel tank, top & bottom loading, hand rewind hose reel, 100' of 1 1/2" ID hose	16,000	-----
0751-01	<u>21/</u> Truck, Tank Fueling Servicing, General Purpose, 2,000 gallon, DED, 4x2, w/pwr steering, 5-speed trans & 2-speed rear axle, PTO-driven pump & meter, single compartment stainless steel tank, top & bottom loading, hand rewind hose reel, 100' of 1 1/2" ID hose	28,000	-----
0756-01	<u>14/</u> & <u>21/</u> Truck, Tank, Aircraft Refueling Unit, 5,000 gallons, AVGAS or Jet Fuel (JP-4 & JP-5), DED, 6x4, with a self-contained pumping system for 300-GPM servicing	56,000	-----
5830-01	<u>17/</u> , Truck, material handling, 4x2, DED with hydraulic activated rear mounted chain type hoist refuse container, power steering	28,000	12,000
5833-01	<u>15/</u> , <u>18/</u> & <u>21/</u> Truck, Materials Handling, tilt-frame type, container hoisting and hauling, 8 to 45-cu yd, DED, 6x4, tilt cab, automatic transmission, hour meter	51,000	-----
5835-01	<u>15/</u> , <u>19/</u> & <u>21/</u> Truck, Refuse Collection, compaction type, 24-cu yd, 4,500-lb capacity container hoisting device at front of truck for use with tilt-over type containers through 8-cu yd size, DED, 6x4, tilt cab, automatic transmission, hour meter	39,500	-----

1/ CAPACITY RATING SYSTEM FOR COMMERCIAL TRUCKS AND TRUCK TRACTORS - The purpose of the following information is to clarify the terminology used in designating the maximum capacity rating of commercial trucks and truck tractors.

a. Background. The rating system, whereby commercial trucks and truck tractors were identified by nominal tonnage rating, i.e., 2-ton, 5-ton, etc., was discarded many years ago. Over the years, as the capacity of trucks increased through the use of better materials and improved design, the nominal tonnage rating lost its significance. It did not indicate the true measure of a truck or truck tractor's load capacity. In fact, it was highly misleading. For example, the so-called "2-ton trucks" now have various payload capacities dependent on the type of body equipment: as a stake truck the payload capacity is approximately 9,500 lbs.; as a van, approximately 8,000 lbs.; as a refrigerator van, approximately 6,500 lbs. The old nominal tonnage rating system is not now recognized by the motor truck industry.

b. Present Rating System. A capacity rating system was developed which permits simple computation of the exact payload capacity of any truck or truck tractor. It has been in use for many years, and is universally recognized by the motor truck industry. All trucks and truck tractors are now classified by:

(1) GROSS VEHICLE WEIGHT (GVW) RATING. This rating is the maximum permissible gross weight capability of the motor vehicle, on its own wheels, as established by the vehicle manufacturer. GVW is expressed in pounds, and is the "Total weight of a vehicle including all equipment, driver, fuel, coolant, body, and payload". In the case of a truck tractor, which has no body, the payload is the semitrailer kingpin load on the truck tractor fifth wheel.

(2) GROSS COMBINATION WEIGHT (GCW) RATING. This rating is applicable to a truck tractor, and is expressed in pounds. It is the combination of the total weight of the tractor plus the weight of the connected trailer including payload.

An understanding of the GVW and GCW rating terminology by everyone involved in truck and truck tractor transportation functions, both operations and management, is essential. It establishes common communication between the user requesting the vehicles and all parties involved in furnishing the equipment to the user.

2/ TRUCK, PANEL, FORWARD CONTROL - This family item was formerly coded 0329-02 and 0329-03, but should now be considered as Code 0722 (utility maintenance truck) when used in PW ("Mr. Fix-It") type operations.

3/ STAKE RACKS FOR STAKE TRUCKS - These vehicles shall be provided with stake racks unless the request(s) for the vehicle(s) specifies that stake racks are not required.

4/ TRUCK, DUMP - These dump trucks are intended for use at naval shore activities for general housekeeping operations. When the primary use of dump

trucks is for hauling full loads of sand, gravel, or earth the following vehicles should be requested:

- a. 16,000 lb GVW truck with 2 cu yd dump body
- b. 24,000 lb GVW truck with 4 cu yd dump body

5/ HYDRAULIC CRANE FOR STAKE TRUCKS - Stake trucks will be furnished equipped with an articulated boom-type hydraulic crane when operational needs exist and when requested. This crane is compactly mounted behind the truck cab and occupies less than 18 inches of space when folded in the travel position. Lifting capacity of the crane is approximately 2,500 lbs @ 13-foot radius and 6,000 lbs @ 5-foot radius; lifting height is approximately 20 feet. The crane operates through a 200-degree slewing sector and is equipped with double-acting, independently-controlled hydraulic outriggers. This equipment is recommended for stake truck loading and unloading operations where a small crane is required and can result in the elimination of an additional unit of lifting equipment as well as realizing a savings in time and manpower. However, the number of units at any one activity must be kept to the minimum consistent with operational needs. The crane is a high cost item. When mounted on a 16,000-lb GVW stake truck, crane cost and truck cost are approximately equal. This equipment is not approved for ammunition and explosives handling (see Equipment Code 0704 and Note 7/).

6/ TRUCK TRACTOR - GCW (Gross Combination Weight) - The GCW's shown are based on over-the-road hauling of full loads at speeds of 50 mph. When tractor semitrailer hauling is essentially on-base and vicinity, speeds do not exceed 25 mph, and grades do not exceed 4 percent, these ratings may be exceeded by 30 percent. Based on these criteria, truck tractor selection should be made as follows:

a. On-base and Vicinity Use:

(1) When speeds do not exceed 25 mph and grades do not exceed 4 percent, the nonfamily Code 0604-00 (24,000 GVW) may be used with 12-ton single axle semitrailer and 20-ton tandem axle semitrailer and should be requested with full justification for the selection .(see paragraph c).

(2) When extensive semitrailer switching operations are encountered, the nonfamily Code 0616-00 (32,000 GVW) semitrailer spotter unit for 12-ton and 20-ton semitrailers should be requested with full justification for the selection accompanying the request (see paragraph c).

b. Over-the-Road Hauling at Speeds up to 50 mph:

(1) Code 0614-01 (32,000 GVW) unit for 20-ton tandem axle semitrailers provided the weight and/or position of the load on the semitrailer does not result in an axle overload condition.

(2) Code 0630-01 (39,500 GVW) unit for tank trailers and other semi-trailers as appropriate.

c. Other Hauling Operations Requirements:

(1) A truck tractor not listed under the Family of Equipment Items,
or

(2) When there is a question as to whether a Family of Equipment truck tractor is suitable for the intended operational requirements or will provide proper hookup compatibility with on-board semitrailers, the following information must be furnished with the request for the truck tractor:

(a) Detailed description of semitrailers with which tractor is to be used, i.e., approximate weight(s), upper fifth wheel plate height(s), landing wheel clearance(s), gooseneck and body dimensions, etc.

(b) Loads to be hauled (type cargo and payload on semitrailer), and operational speeds.

(c) Approximate load at kingpin.

(d) Haul distance

(e) Terrain to be traversed (general road conditions and percent grades encountered).

(f) Critical maneuverability requirements.

7/ TRUCK, AMMUNITION HANDLING - This equipment is approved for handling ammunition and explosives. The complete unit can be described as follows.

The truck is a 4x2 diesel engine driven truck cab and chassis with a minimum gross vehicle weight rating of 24,000 lbs. A fully-hydraulic articulated boom crane is frame-mounted at the rear of the cab. The capacity of the crane is 4,000 lbs at 10-foot working radius and 2,000 lbs at a working radius of 18 feet with 360-degree boom rotation. A platform body is located at the rear of the crane and is approximately 144 inches by 95 inches. A cargo conversion unit consisting of 14-inch high front and side body panels and a 16-inch tailgate is provided to contain ordnance shipments. A standard Society of Automotive Engineers (SAE) 7-conductor trailer electrical connector is provided for use when towing bomb and weapons trailers. The truck is used in loading, unloading, and transporting munitions as required by Weapons Department operations at NAVSEACOM/NAVAIRCOM activities.

8/ TRUCK, PLATFORM, GED - The gasoline engine driven (GED) platform truck is a self-contained, low-silhouette, low speed, 4x2 vehicle used for supporting airfield flight line service and for maintenance equipment hauling. The truck is also furnished with a rear-mounted pintle hook that can be used for towing lightweight (under 2,000 lbs) ground support equipment (GSE) to parked aircraft when required in maintenance or servicing operations. The rear platform can be used to carry service tools and equipment up to a 1,000-lb payload. The unit is furnished with a removable cab for cold climate operations. The vehicle is limited to on-station operations only.

9/ TRUCK, PLATFORM, EMD - The electrical motor driven (EMD) platform truck

is used to furnish transportation of maintenance personnel, tools, and aircraft servicing equipment to aircraft parked at flight line servicing areas, and is also used for delivery in and out of hangar spaces. With its low-silhouette, low-speed operation and excellent maneuverability this platform truck is considered to be a safer vehicle around congested flight lines. A rear pintle hook is provided for towing lightweight GSE (under 2,000 lbs) needed in aircraft servicing. The vehicle is furnished with a removable cab (for driver and passenger) for cold climate operations. Only on-station use (flight line area) will be authorized using the EMD vehicle.

10/ TRUCK, FIELD LUBRICATING AND FUEL SERVICING, 4X2 - This vehicle is equipped to provide complete service station service (fuel, oil, radiator solution, lubricants, and air) for automotive, industrial, construction, and specialized ground support equipment. The 19,000 GVW truck unit is suitable for general purpose application at activities where the equipment inventories are mainly composed of automotive and materials handling equipment and a limited inventory of construction equipment.

11/ TRUCK WRECKER - Activities should consider replacement of the large 12-ton wrecker with the smaller 5-ton wrecker which will adequately service the majority of the automotive inventory. Consideration should be given to using other available equipment or commercial service for infrequent requirements for a large capacity wrecker. Only larger activities with sufficient utilization should request the large 12-ton wrecker.

12/ TRUCK, LOADER, AIRCRAFT CARGO - The 9-ton hi-lift aircraft cargo loader is a self-contained gasoline engine driven unit intended to be used to facilitate loading, unloading, and transporting cargo to and from aircraft and for transporting cargo on and off naval air stations. The use of this truck is especially practical when there is a difference in height between the loading and unloading platforms. The hi-lift truck is capable of handling loads up to 18,000 lbs and a vertical lift height of 13 feet. The hi-lift platform is mounted on a commercial 6x4, 39,500 GVW truck chassis which also supplies the power for the scissors type, ram operated, hydraulic lift stake platform body.

The 2-ton hi-lift aircraft cargo loader is intended for use in general flight line servicing of aircraft and in the specific loading and unloading of cargo and mission operational equipment through the cargo hatch and door openings of Navy patrol type aircraft. The vehicle is a standard commercial type truck cab and chassis, gasoline engine driven, 4x2, 14,000 lb GVW with a hydraulic lift platform body that will lift a 4,000 lb payload to a height of 10 feet from ground position. The platform body comes equipped with removable, expanded metal front and side panels. This vehicle was formerly coded 0707-03.

13/ TRUCK, TANK, AVIATION LUBRICATING OIL DISPENSING - This is to be used for transporting and dispensing aircraft engine oil. The 500-gallon capacity tank is mounted on a 16,000 GVW, 4x2 chassis, powered by a gasoline engine that is also used to power pumping equipment through a power take-off (PTO). The vehicle has all the necessary piping, control, and safety equipment required for the servicing operations.

14/ TRUCK, TANK, AIRCRAFT REFUELING UNIT - Designed to fuel all types of air-

craft, this truck provides single-point and overwing servicing for refueling or defueling. The chassis is a standard commercial, tilt cab, 6x4 unit powered by a diesel engine with automatic transmission and power steering. A PTO from the vehicle engine is used to drive the pumping system. The aviation fuel tank has a capacity of 5,000 gallons. The pumping system consists of a pump, filter-separator (to remove air, water, and foreign matter from fuel), automatic control valves, meters, two hose reels with 50 feet of hose, and dispensing nozzles. When fueling by the single-point method, the pumping system automatically maintains nozzle pressure at 50 pounds per square inch gage (PSIG) at any flow rate from 0 to 300 gal/min (GPM). A surge control system limits total pressure to 120 PSIG when valve closure time is 0.5 seconds. For overwing servicing, the pumping system delivers 100 GPM.

15/ DESIGN OF REFUSE COLLECTION SYSTEMS - Large yearly expenditures are involved in the collection of refuse from naval activities. Therefore, the economic design of collection systems warrants serious attention. When it is required to replace, either partially or wholly, or augment an existing system, a study should be made to determine if the current system is the most economical. If not, is it economically feasible to change to another type system rather than replace or augment the existing system? Outlined herein are some general procedures which can be used to design and evaluate collection systems and operations.

The overall design of refuse collection systems for naval installations can be divided into five steps:

- Step 1. Evaluation of existing or defined conditions.
- Step 2. Selection of suitable types of collection systems.
- Step 3. Design of collection systems for the given conditions.
- Step 4. Economic analysis of each system and selection of the most economic one.
- Step 5. Prepare data needed for submission of requirements for refuse handling equipment.

a. Step 1. - Evaluation of Existing or Defined Conditions. For any specific installation the following conditions must be evaluated before a suitable collection system or systems can be selected and designed:

- (1) Determine the types and densities of the refuse which will be produced.
- (2) Determine the number and location of pickup points for each category of refuse.
- (3) Determine the quantity of each type of refuse generated at each pickup point.
- (4) Determine type and location of disposal site.

(5) Physical conditions such as climate and layout and condition of streets should be thoroughly evaluated.

b. Step 2. - Selection of Suitable Types of Collection Systems. Summarized herein are the systems and equipments which may be used for the collection of the various types of refuse produced at activities of naval shore activities.

The selection of the system or systems to be used will depend on the types of refuse produced as well as the refuse production rates.

There are essentially five types of refuse handling equipment currently being used in naval shore activities. Three of these are included in the Family of Equipment Items. (The Truck, Rufuse Collection, side & rear loading, compaction type, 25 cu yd (5810-01 & 02), has not been included as it is considered an obsolete and uneconomical system, except in rare cases.) Descriptions of the three remaining refuse collection systems are provided in the following notes 17/ through 19/.

16/ DELETED

17/ TRUCK, MATERIALS HANDLING, REAR CHAIN HOIST TYPE, (CODE 5830-01) This vehicle has application in the hauling of small amounts of non-compactable (wood, scrap metal, sand, etc) material or wet trash over small distances from confined areas not accessible to the 5833-01 vehicle. It is emphasized that the use of this vehicle in refuse operations is extremely inefficient and should be avoided whenever possible.

18/ TRUCK, MATERIALS HANDLING, CONTAINER HOISTING AND HAULING, 40 CU YD CAPACITY (CODE 5833-01) - The use of this type equipment is ideally suited for the removal of refuse or scrap from points where it is generated at a considerable rate such as at piers, wharves, commissaries, mess halls, etc. The advantage of this system is its flexibility. Various types and sizes of containers are available for collection of all types of refuse and only one operator is required. Requesting equipment under the 5833-01 code provides only the truck chassis with attached tilt mechanism, no containers/bodies are provided when this code is cited. Compaction type containers/bodies will be provided when requested and described as a non-standard item, code 5833-00. Non-compaction containers/bodies are a local procurement responsibility and will not be provided under the 5833 code..

19/ TRUCK, REFUSE COLLECTION, COMPACTION TYPE (CODE 5835-01) - The self-loading compaction system (front end loader) has general application for collection of rubbish from points with small to relatively large production rates. It is the most economical system for any practical haul distance. The advantages are its flexibility and versatility in servicing various operations, equipment costs, and the requirement of having only one operator. For the most efficient and economic operation, the 8 cu yd container should be the largest container used with this system. The modification of existing containers used with the Code 5830 truck, to make them compatible with this system, is not recommended.

20/ Activities currently utilizing Code 5830 and Codes 5820-01 and -02 should evaluate their refuse collection methods prior to the replacement of this type equipment. Both systems are expensive to operate. The Code 5830 should be evaluated from the standpoint that one operator and one truck with container is required to dispose of approximately 8 cu yd of refuse. Codes 5820-01 and -02 should be evaluated from the standpoint that a minimum of three personnel are required for one 16 cu yd compaction truck. It is believed that a large percentage of the Codes 5830's can be phased out if properly evaluated.

a. Step 3. - Design of Collection Systems for Given Conditions. Once a possible system or systems have been selected, the next step is to prepare designs for these systems. This entails determining container, labor and vehicle requirements, laying out collection routes, and developing collection schedules.

b. Step 4. - Economic Analysis of Each System and Selection of the Most Economic. Selection of the optimum refuse collection system should be based on an economic analysis of each alternate system. Economic analysis must include appropriate charges for labor, equipment amortization, operations and maintenance, and administration in arriving at an annual unit cost per ton for removal of the refuse for the system.

c. Step 5. - Prepare Data Needed for Submission of Requirements for Refuse Handling Equipment:

(1) New System. Copy of study made including plot layout showing location, type, and size of each container, amount of refuse generated, and collection schedule.

(2) Augmentation. Copy of study made including plot layout showing location, type, and size of each container, amount of refuse generated, and collection schedule.

(3) Replacement. Furnish complete information on equipment, including age.

21/ GENERAL - There have been many cases where complete refuse collection units have been replaced when only the truck chassis required replacement. Normally, the hydraulic hoists will outlast three truck chassis. Special attention should be directed to the condition of on-vehicle equipment, such as bodies and hydraulic lift hoists, to determine whether the complete vehicle or the truck chassis only requires replacement. Only the truck cab and chassis should be requested when a detailed inspection indicates that the on-vehicle equipment does not need replacement. In such cases, body or hoist data should be forwarded with the vehicle request. This is necessary to assure that the vehicle chassis furnished will have the correct dimensions for properly mounting the body or hoist. This same principle applies to other types of vehicle bodies such as wreckers, line construction bodies, fuel servicing tanks, etc.

P-1 LINE ITEM 03
TRAILERS 1/

<u>NAVFAC</u> <u>Equip. Code</u> <u>Type Designator</u>	<u>Item Description</u>	<u>Payload</u> (lbs.)
0812-01	<u>2/ Semitrailer, Stake, Single Axle, dual wheels, 30' long, w/air service brakes and parking brakes. Fifth wheel plate height 48" ± 1"</u>	24,000
0813-01	<u>Semitrailer, Van (fully enclosed), Single Axle, dual whls, 30' long, w/double rear doors, aluminum skin, air service brakes and parking brakes. Fifth wheel plate height 48" ± 1". Maximum height 150"</u>	24,000
0816-01	<u>2/ Semitrailer, Stake, Tandem Axle, dual whls, 35' long, w/air service brakes and parking brakes. Fifth wheel plate height 48" ± 1"</u>	40,000
0817-01	<u>Semitrailer, Van (fully enclosed), Tandem Axle, dual whls, 35' long, w/double rear doors, aluminum skin, air service brakes and parking brakes. Fifth wheel plate height 48" ± 1". Maximum height 150"</u>	40,000
0819-01	<u>Semitrailer, Van, Refrigerator, Single Axle, dual whls, 30' long, w/double rear doors, aluminum skin, air service brakes and parking brakes. Fifth wheel plate height 48" ± 1". Maximum height 150"</u>	24,000
0820-01	<u>Semitrailer, Van, Refrigerator, Tandem Axle, dual whls, 35' long, w/double rear doors, aluminum skin, air service brakes and parking brakes. Fifth wheel plate height 48" ± 1". Maximum height 150"</u>	40,000
0822-01	<u>Semitrailer, Lowbed, Stake, Drop Frame, Tandem Axle, dual whls, w/decking over full width gooseneck and wheel wells, air service brakes and parking brakes. Approx length 40' (30' lower deck), 45" lower deck height. Fifth wheel plate height 48" ± 1"</u>	40,000
0825-01	<u>3/ Semitrailer, Lowbed, 4 dual whls, w/walking beam or spring suspension, air service brakes and parking brakes. Approx 40' total length (minimum 16' of level deck between fixed gooseneck and wheel wells). Fifth wheel plate height 48" ± 1"</u>	70,000
0848-02	<u>Semitrailer, rear dump, demolition refuse, tandem axles, dual wheels, 36 cubic yard, split rear door self powered. This trailer provides a means to move large quantities of non-compactable trash (steel scrap, concrete, sand, dunage, etc) to dump site.</u>	40,000

P-1 LINE ITEM 03
TRAILERS 1/ (Continued)

<u>NAVFAC</u>	<u>Equip. Code</u>	<u>Type Designator</u>	<u>Item Description</u>	<u>Payload (lbs.)</u>
		0862-01	4/ Trailer, Tiltdeck, Lowbed, Tandem Axle, single whls, w/deck dropped between whls, fenders and electric brakes. Approx dimensions, overall length 20', deck length 16', deck height loaded 25", deck width 76", tilt angle 9°	12,000
		0881-01	Trailer, Tank, 2-wheel, 500-gal, general purpose (water, diesel fuel, oil, gasoline), gravity discharge, without service brakes, parking brake only	
		0888-01	Semitrailer, Tank, Fuel Servicing, Single Axle, 3,000-gal, dual whls, single compartment stainless steel tank, w/top and bottom loading facility, 150-GPM pump, totalizing meter, manual rewind hose reel, 100' of 1 1/2" ID synthetic rubber hose, air service brakes and parking brakes. Fifth wheel plate height 48" <u>± 1"</u>	
		0890-01	Semitrailer, Tank, Fuel Servicing, Tandem Axle, 5,500-gal, dual whls, single compartment stainless steel tank, w/top and bottom loading facility, 200-GPM pump, totalizing meter, manual rewind hose reel, 100' of 1 1/2" ID synthetic rubber hose, air service brakes and parking brakes. Fifth wheel plate height 52" <u>± 1"</u>	

1/ SEMITRAILERS

a. Semitrailers will be equipped with air brakes. Existing (on-board) semitrailers with braking systems which cannot be coupled to air brake equipped truck tractors should be considered for replacement. This determination should be made before auxiliary vacuum conversions are added to, or requested for, air brake equipped truck tractors.

b. Kingpin location and landing wheel clearance dimensions for van, stake, refrigerator, lowbed, and tank semitrailers will be as follows:

Axles	Centerline of Kingpin to Front of Semitrailer		Landing Gear Clearance From Centerline of Kingpin	
	Single	Tandem	Single	Tandem
Van	24"	36"	82"	82"
Refrigerator	24"	36"	82"	82"
Stake	24"	36"	82"	82"
Tank, Fuel Servicing	24"	36"	66"	82"
Lowbed	18"	18"	82"	82"

2/ STAKE RACKS FOR STAKE SEMITRAILERS - These vehicles will not be provided with stake racks unless the request(s) for the vehicle(s) specifies that stake racks are required.

3/ SEMITRAILERS, LOWBED - Lowbed semitrailers will be level deck type with deck openings at wheelwells. The semitrailers will be equipped, at sides and rear, with means for attaching loading ramps, but loading ramps will not be furnished unless requested. Three heavy-duty lashing "D" rings will be located on each side of the level deck, one on each side of the gooseneck and two at the rear. Deck height will be approximately 40 inches, ground clearance approximately 15 inches, and centerline of kingpin to front of gooseneck dimension will be 18 inches. If operational requirements dictate lower deck height, drop deck type lowbeds with a 28-inch deck height and 9-inch ground clearance are available. Where operational need exists, and when requested, lowbed semitrailers can be furnished with a sloping (beaver-tail) deck at rear.

4/ TILT DECK TRAILER AND SEMITRAILER - The Code 0862-01 tilt deck trailer is suitable for self-loading of forklift trucks equipped with small diameter hard rubber wheels and similar equipment because it has a low deck height and 9-degree deck tilt angle.

5/ DELETED

P-1 LINE ITEM 04
CRUSHING, MIXING, BATCHING, AND PAVING EQUIPMENT

<u>NAVFAC</u> <u>Equip. Code</u> <u>Type Designator</u>	<u>Item Description</u>
2740-01	<u>1/ Kettle, Heating, Bitumen, 80-gal capacity, trailer mounted, 2 pneumatic tires, GED, hand-held spray bar, light fuel oil or kerosene burner</u>
2740-02	<u>1/ Kettle, Heating, Bitumen, 165-gal capacity, trailer mounted, 2 pneumatic tires, GED, hand-held spray bar, light fuel oil or kerosene burner</u>
2760-01	<u>2/ Kettle, Heating, Rubberized Joint Sealer, Double-Jacketed, GED, with agitated kettle, 75-gal tank capacity, trailer mounted, 2 pneumatic tires, hot oil heated, liquified petroleum gas (LPG) burners, thermostatically controlled, 40-gal/hr (GPH) melting capacity, with heated hose compartment</u>

NOTES:

P-1 LINE ITEM 04

1/ KETTLE, HEATING, BITUMEN - The 80 and 165-gallon bitumen heating kettles are used primarily for small asphalt pavement patching jobs and to provide melted tar or asphalt for roofing operations. A hand-operated 10 gal/min (GPM) pump with a spray bar is provided with the 80-gallon unit when requested. The 165-gallon unit includes a removable gasoline engine driven 10-GPM bitumen pump with spraying attachment. Both units are mounted on a two-wheel, pneumatic-tired trailer capable of being towed at 25 mph.

2/ KETTLE, HEATING, RUBBERIZED JOINT SEALER - The 75-gallon rubberized joint sealer heating unit differs from the bitumen (or asphalt) kettles in the manner of heating. The sealer is very sensitive to overheating. Heat transfer is accomplished through hot oil circulation rather than with immersion heaters as in the asphalt kettles. Heat is generally provided by liquid propane or kerosene burners. The liquid propane is preferred since it is easier to control. Use of this equipment is limited to maintenance of concrete expansion joints on runways, roadways, parking aprons, and building floor slabs. The 75-gallon kettle should have sufficient capacity to handle the majority of this type expansion joint maintenance. This unit is mounted on a two-wheel, pneumatic-tired trailer with a detachable tow-bar for towing at road speeds up to 25 mph.

P-1 LINE ITEM 05
AIR COMPRESSING, DRILLING AND BLASTING EQUIPMENT

NAVFAC Equip. Code <u>Type Designator</u>	<u>Item Description</u>
3110-01	<u>1/ Compressor, Air, Portable, 125-CFM, 100-PSI, Rotary, trailer mounted, diesel engine driven (DED)</u>
3135-01	<u>1/ Compressor, Air, Portable, 250-CFM, 100-PSI, Rotary, trailer mounted, DED</u>

NOTES: P-1 LINE ITEM 05

1/ COMPRESSOR, AIR

a. Most maintenance requirements for compressed air can be met quite adequately with a 125 cu/ft min (CFM) unit. A 125-CFM compressor will accommodate the following:

- 2 Paving breakers or
- 1 Rock drill or
- 4 Tie tampers or
- 2 Spike drivers

b. Line losses must be considered when calculating air requirements. Line loss with new 3/4-inch hose is approximately 5.5 lb/sq in (PSI) per 50 feet at 110 CFM. Line loss in an old air hose is approximately double that of a new hose.

c. When the air requirements are critical, close attention should be given to the compressor and to the size, length, and condition of pipe and hose. Specific information is available from handbooks, industry literature, and from local suppliers. Small compressors can be manifolded to supply large volumes of air.

P-1 LINE ITEM 06
EARTHMOVING EQUIPMENT

<u>NAVFAC</u> <u>Equip. Code</u> <u>Type Designator</u>	<u>Item Description</u>
4420-02	<u>1/</u> Grader, Road, Motorized, 6x4, DED, 100 net HP, 22,500 lbs minimum weight, w/12 ft blade, 360° moldboard rotation, power shift transmission, power steering, front tires same as rear
4531-01	<u>2/ & 6/</u> Loader, Scoop Type, Front End, Wheeled, 4x2, DED, 60 net HP, 1 cu yd, general purpose bucket, 4500 lb operating capacity, 102-inch dumping height.
4531-02	<u>2/ & 6/</u> Loader, Scoop Type, Front End, Wheeled, 4x2, DED, 60 net HP, 1 cu yd, general purpose bucket, 4500 ld operating capacity, 102-inch dumping height, equipped with backhoe with 24 inch standard digging bucket.
4531-03	<u>2/ & 6/</u> Loader, Scoop Type, Front End, Wheeled, 4x2, DED, 60 net HP, 1 cu yd, multipurpose (four in one) bucket, 4500 lb operating capacity, 102 inch dumping clearance.
4531-04	<u>2/ & 6/</u> Loader, Scoop Type, Front End, Wheeled, 4x2, DED, 60 net HP, 1 cu yd, multipurpose (four in one) bucket, 4500 lb operating capacity, 102 inch dumping clearance, equipped with backhoe with 24 inch standard digging bucket.
4630-01	Roller, Road, Motorized, Vibrating, Tandem, self-propelled, GED, empty weight 2,400 lbs min, maximum ballasted weight 3,700 lbs, 20" - 24" diameter by 26" - 36" wide guide drum, 22" - 24" diameter by 28" - 36" wide compaction drum; maximum vibration frequency not less than 1,400 cycles per min (CPM)
4872-01	<u>2/ & 6/</u> Tractor, Wheeled, Industrial, 4x2, GED, 12 net horse-power (HP), w/hyd actuated 3-point hitch, 1,800 revolutions per minute (RPM) rear-mounted PTO, and rear tires with R-3 flotation tread
4874-01	<u>2/ & 6/</u> Tractor, Wheeled, Industrial, 4x2, GED, minimum 30 Net HP, rear-mounted live PTO @ 540 RPM, 3-point hitch, swinging drawbar, heavy duty front axle, power steering. Rear tires to have R-3 flotation tread
4875-01	<u>2/ & 6/</u> Tractor, Wheeled, Industrial, 4x2, GED, minimum 50 Net HP, rear-mounted independent PTO @ 540 RPM, 3-point hitch, swinging drawbar, heavy duty front axle, power steering. Rear tires to have R-3 flotation tread

- 4878-01 8/ Tractor, Wheeled, Industrial, 4x2, air-cooled, GED, 16 HP minimum, hydrostatic or hydraulic transmission, automotive controls and brakes; with rear-mounted automatic locking pintle hook for use in towing airfield ground support equipment (GSE)
- 4878-02 8/ Tractor, Wheeled, Industrial, 4x2, GED, 30 drawbar horsepower (DBHP) minimum, pneumatic tired, removable cab, with driver and passenger seat, heater and defroster, equipped with front and rear-mounted pintle hooks for use in towing aircraft ground support equipment (GSE)

NOTES:

P-1 LINE ITEM 06

1/ GRADER - The net horsepower of the Code 4420-02 motor grader has been changed from 85 to 100. This increase in horsepower reflects the industry trend toward better and more efficient engine performance rather than the adoption of a heavier, larger unit. This grader, with a 12-foot blade, is a standard commercial unit available competitively from a number of reputable manufacturers.

The prime function of the unit should be road and shoulder grading. While a grader is an acceptable auxiliary tool for ice removal and snow plowing, these functions of themselves cannot warrant a motor grader.

A scarifier is available as an optional attachment. When an operational need exists, it should be requested with the original procurement.

Equipment such as front end loaders, dozers, and scraper-grader blades mounted on industrial tractors should be used for small grading projects. An acceptable utilization factor can be achieved on a motor grader only when an activity has extensive unimproved road and ditch maintenance operations.

2/ FULL-TRACKED (CRAWLER) VS. WHEELED TRACTORS, FRONT END LOADERS, AND DOZERS - There are few operations at naval shore activities which cannot be done more quickly and more efficiently with one of the new pneumatic tired tractors or loaders than with equivalent crawler mounted equipment. Slow speed, 6 mph maximum, plus the potential damage to pavement from steel tracks, make lowboy trailers necessary for moves of any distance. Rubber tired units travel readily from job to job and usually work at higher speeds. The determination as to whether a wheel or crawler tractor is to be requested should be based on actual operating requirements and not on the relative merits or mobility of crawler tracks vs. wheels.

3/ DELETED

4/ DELETED

5/ DELETED

6/ TRACTOR, WHEEL, INDUSTRIAL TYPE

The 60 Net HP tractor, available with a front end loader and backhoe, should be able to adequately handle most maintenance requirements. Production type equipment is not required for most maintenance operations. The multipurpose capabilities of this nonproduction type equipment will do all the work of a heavy production unit given a little more time.

Three types of PTO's are available on industrial tractors. The transmission type PTO, wherein a single clutch engages both the tractor drive train and the PTO simultaneously, is now supplied only on the 12 net HP units (Code 4872). An over-powered unit for the loads involved is required to accelerate both tractor and PTO at the same time.

The Code 4874, 40 Net HP tractors are supplied with a live or continuous PTO. A single clutch pedal controls both the tractor transmission and the PTO. With the clutch depressed the PTO can be engaged and the tractor gear selected. Releasing the clutch halfway engages the PTO thus permitting its load to be accelerated before the clutch is completely released for accelerating the tractor.

The Code 4875, 50-Net HP tractors are supplied with independent PTO's which permit completely independent operation of either tractor or PTO.

Unless otherwise requested, industrial tractors equipped with front end loaders will be supplied with type R-4 industrial "sure grip" tread rear tires. All other industrial tractors will be furnished with type R-3 nondirectional block, all weather "flotation," rear tires. Front tires will be multirib type F-3 or I-1.

Upon request any of the following may be supplied: Type R-1 deep lug, R-2 special service, R-3 all weather "flotation," or R-4 industrial "sure grip" rear tires; and type F-1 single rib, F-2 super rib, or F-3 multirub front tires.

7/ DELETED

8/ DELETED

9/ TRACTOR, WHEELED, INDUSTRIAL, WITH SLOPE MOWER - See Notes 9/ and 10/ at the end of the section for P-1 Line Item 08, Miscellaneous Construction and Maintenance Equipment.

P-1 LINE ITEM 07
LIGHTING AND POWER EQUIPMENT

NAVFAC Equip. Code <u>Type Designator</u>	<u>Item Description</u>
5110-21	Floodlight Set, 5 KW, GED, Trailer Mounted with 2-1,000 watt floodlights.
5121-11	Generator Set, 15 KW, DED, skid mounted, 60 HZ, 120/208V - 240/416, 3 phase, 4 wire
5122-11	Generator Set, 30 KW, DED, skid mounted, 60 HZ, 120/208V 240/416, 3 phase, 4 wire
5124-11	Generator Set, 60 KW, DED, skid mounted, 60 HZ, 120/208V 240/416, 3 phase, 4 wire

P-1 LINE ITEM 08
MISCELLANEOUS CONSTRUCTION AND MAINTENANCE EQUIPMENT

Type Designator <small>NAVFAC Equip. Code</small>	<u>Item Description</u>
5170-01	Welder, Arc, Electric, GED, Trailer Mounted, 300-amp, 100 percent duty cycle, DC, w/dual current control and 110-volt AC or DC auxiliary power
5408-01	<u>1/</u> Cleaner, Vacuum, Airfield Runway, Truck Mounted, equipped with blower fan, suction pickup hood
5410-01	Cleaner, Steam, Wheel Mounted, 180 GPH wet steam @ 75-125 PSI, Diesel, JP-5, or kerosene fired, with 115-v, 60-HZ, EMD pump, 20-gal solution tank, vapor cleaning gun, and one 15-ft hose
5412-01	Cleaner, Pipe/Sewer, Rotating Cable, 2-wheel trailer mounted, GED, with 400 feet of 5/16 inch rod, footage counter; 2, 4 & 6-inch auger, cork screw and double-edge cutter plus 4, 6 & 8-inch root saw
5421-01	<u>2/</u> & <u>3/</u> Sprayer, Pesticide, Hydraulic, 200-gallon tank, trailer mounted, two-wheel, pneumatic tired, GED, mist to solid stream type spray, w/tank agitator, piston type pump, 10 GPM at 400 PSI, w/pressure regulator, one 100-foot discharge hose on reel, one spray gun w/adjustable spray nozzle for mist to solid stream, w/discharge control valve. MIL-S-28526(YD)
5421-02	<u>2/</u> & <u>3/</u> Sprayer, Pesticide, Hydraulic, 400-gallon tank, trailer mounted, two-wheel, pneumatic tired, GED, mist to solid stream type spray, w/tank agitator, piston type pump, 25 GPM at 700 PSI, w/pressure regulator, two 100-foot discharge hoses on two reels, two spray guns w/discharge control valves and adjustable spray nozzles. MIL-S-82068(YD)
5421-03	<u>2/</u> , <u>3/</u> & <u>4/</u> Sprayer, Pesticide, Hydraulic, 500-gallon tank, with spray boom, trailer mounted, two-wheel, pneumatic tired, GED, mist to solid stream type spray, w/tank agitation, piston type pump, 25 GPM at 700 PSI, w/pressure regulator, two 100-foot discharge hoses on two reels, two spray guns w/discharge control valves and adjustable spray nozzles. MIL-S-82068(YD)
5421-04	<u>5/</u> Sprayer, Pesticide, Mist/Dust Turbine, trailer mounted w/o turntable, 10,000 CFM at 150 MPH rated air discharge, GED, two-wheel, pneumatic tired, 100-gallon liquid tank w/agitator, 100-pound dust/granule hopper w/agitator. MIL-S-23923, Type II

- 5421-05 5/ & 6/ Sprayer, Pesticide, Mist/Dust Turbine, trailer mounted with turntable, 10,000 CFM at 150 MPH rated air discharge, GED, two-wheel, pneumatic tired, 50-gallon liquid tank w/agitator, 100-pound dust/granule hopper with agitator.
MIL-S-23923, Type A
- 5421-06 5/ Sprayer, Pesticide, Mist/Dust Turbine, skid mounted w/o turntable, GED, 10,000 CFM at 150 MPH rated air discharge, 50-gallon liquid tank w/agitator, 100-pound dust/granule hopper w/agitator. MIL-S-23923, Type B
- 5421-07 5/ & 7/ Sprayer, Pesticide, Mist/Dust Turbine, skid mounted w/turtable, GED, 10,000 CFM at 150 MPH rated air discharge, 50-gallon liquid tank w/agitator, 100-pound dust/granule hopper w/agitator. MIL-S-23923
- 5421-08 8/ Sprayer, Insecticide, Aerosol Generator, Ultralow volume/ultralow dosage (ULV/ULD) type, skid mounted, GED, dispersal capacity up to 0.25 GPM, w/air compression blower, w/atomizing nozzle(s), w/remote controls including flowmeter, temperature gauge, and air pressure gauge.
- 5435-01 Marker, Traffic Line, Road, 3 to 6-inch single continuous or intermittent stripe, self-propelled, GED, PRT, reflective bead dispenser, 10-gal paint tank, maximum weight 500 lbs and forward speed of not less than 2 1/2 MPH
- 5435-02 Marker, Traffic Line, Road, 3 to 6-inch single or double continuous or intermittent stripe, self-propelled, GED, PRT, operator's platform, reflective bead dispenser, 12-gal paint tank and forward speed of not less than 5 MPH
- 5621-01 9/ Mower, Lawn, Rotary Flat Knife, Towed, PTO powered, 3-point hitch mounted, rubber-tired caster wheel(s), 72" cutting swath
- 5621-02 9/ Mower, Lawn, Rotary Flat Knife, Towed, PTO powered, 3-point hitch mounted, rubber-tired wheels, 114" cutting swath
- 5621-03 9/ Mower, Lawn, Heavy Duty, Rotary Flat Knife, Towed, PTO powered, 3-5' units (15' swath), outer units hydraulically raisable w/automatic blade disconnect when outer units are raised
- 5621-04 9/ Mower, Lawn, Rotary, self propelled, GED, 14 Net HP, integral riding seat, 40 inch cutting swath.
- 5621-05 9&10/ Mower, Lawn, rotary, self propelled, GED, 25 Net HP, integral riding seat, 72 inch cutting swath.
- 5621-06 9/ Mower, Lawn, rotary , self propelled, DED, 6x6, 28 Net HP, w/self leveling cab for mowing ammunition magazines with slopes to 45 degrees, 72 inch cutting swath.

- 5630-01 9/ Mower, Lawn, five gang reel, self propelled, GED, 60 Net HP, intergral riding seat, 18 MPH, 11 foot cutting swath, dual rear tires with R-3 flotation tread.
- 5650-01 9/ Mower, Lawn, 60 inch sickle bar, self propelled, 14 Net HP, integral riding seat, 40 inch cutting swath.
- 5650-05 9/ Mower, Lawn, Towed, PTO powered, 3-point hitch, flail type, 6' cutting swath
- 5700-02 11/ Sweeper, Rotary, Industrial, self-propelled, driver operated, 12 cu ft, GED, w/vacuum dust control unit and right side brush, 42" main broom, 53" swath
- 5710-01 12/ Sweeper, Street, Permanent Magnet type, trailer mounted, 2 PRT, 96-inch swath, magnet w/adjustable suspension height, and scrap discharge device
- 5720-01 13/ Sweeper, Rotary, Street, Pickup, self-propelled, GED, 3 cu yd, w/250-gal minimum water tank, spray system, 8' minimum swath with one gutter boom
- 5745-01 Sweeper, Rotary, Towed, Snow, Air Blast, GED, 3-whl, PRT, brush 36" dia, 12' swath @ 30°, with 12,000 CFM blower, reversible right and left. (Airfield use only)
- 5750-03 Snow Removal Unit, High Speed Rotary, self-propelled, 4x4, DED, full power shift transmission and torque converter, truck loading and casting chute, capable of clearing a 102-inch swath at a rate of 40 tons per minute. (Airfield use only)
- 5757-02 Snowplow, Rollover, Truck Mounted, w/right and left-hand leveling wings, 10-foot plowing width, 4x4, DED, full power shift transmission and torque converter; with 5 cu yd dump body. (Airfield use only)
- 5757-03 Snowplow, Rollover, Truck Mounted, w/right and left-hand leveling wings, 10-foot plowing width, 4x4, DED, full power shift transmission and torque converter; with 6 cu yd sander body. (Airfield use only)
- 5797-01 14/ Scrubber, Shipdeck, Self-Propelled, DED, 60-inch swath w/hydraulically operated rotary scrubbing brushes, heavy duty vacuum/squeegee pickup system, 100-gallon solution tank, and 125-gallon recovery tank. (Shipboard use only)

1/ CLEANER, VACUUM, AIRFIELD RUNWAY - The runway cleaner is a high speed, truck mounted, diesel engine driven vehicle intended for use in removing debris (foreign objects that could be ingested by jet engines) from the surface of paved airfield runways, taxistrips, parking areas, and other airfield paved areas required for aircraft operations. The sweeper components are mounted on a standard commercial truck chassis. An auxiliary engine powers a blower that creates a vacuum for suction and an air blast to agitate the debris under the suction hood which draws the dirt into a 3-cubic yard hopper. A filter system cleans the air before it passes through the blower to the outside of the unit. The cleaning swath is 7 1/2 feet wide.

2/ PESTICIDE SPRAYERS - These equipments are suitable for remote operations against mosquitoes, ornamental and turf pests, and to control pest weeds with oil solutions, emulsions, and suspensions.

3/ These sprayers will be procured with a stainless steel tank. A Fiber-glass tank is available at increased cost as a desirable option.

4/ The Code 5421-03 sprayer weighs approximately 5,000 pounds when filled. It should be considered only for shore activities with special control operational requirements.

5/ This equipment is suitable for outdoor control operations against mosquitoes, ornamental and turf pests with oil solutions, emulsions, suspensions, dusts and granules. (Recommend procurement less battery, radio suppression equipment and, where applicable, tires.)

6/ This equipment not suitable for use in rough terrain.

7/ For most activities' pest control operations outdoors, Equipment Code 5421-07 is the equipment item of choice. A Fiberglas liquid tank of 100 gallons is available at increased cost as a desirable option. (Recommend procurement less battery, radio suppression equipment and, where applicable, tires.)

8/ This equipment is suitable for outdoor control of mosquito and other flying insects with ultralow volume/ultralow dosage oil-based solution concentrates. Trained and certified applicator personnel are required to operate this equipment.

9/ MOWERS - The family of mowers selected will satisfy, under normal conditions, the majority of mowing requirements encountered at naval shore activities. Rotary mowers are included in the family, but they are not recommended except in those instances where all safety factors have been minutely weighed and examined with favorable results. Several general rules that must be satisfied and which can be used in determining mower equipment requirements are as follows:

a. The family of wheeled tractors, Codes 4872-01, 4874-01, and 4875-01 will satisfy the requirements for prime mowers for towed mowers. Special care should be used in selecting the prime mower to assure that the multipurpose application of the tractor is considered. Do not use Codes 4878-01 & -02 (former Codes 4872-04 & 4874-04) GSE Tow Tractor for this application. Self propelled mowing equipment, Code 5621, is available with attachments to increase their productivity and utility. When requested and justified, the following attachments are available:

5621-04 Grass catcher, leaf mulcher and lawn edger

5621-05/6 Flail mower, 60 inch sweeping broom, snow blower and lawn edger

b. The growing rate of grasses for specific locales and the height that grasses will be allowed to grow between cuttings must be established before realistic mowing plans and equipment requirements can be developed. These facts should be matters of record and a part of the operating criteria maintained at each activity.

c. The number of mowers and personnel required can be determined if the area to be maintained, the equipment operating speed and the width of the cutting swath are known.

d. From a standpoint of economy, every effort should be made to concentrate upon a minimum number of sizes and types of mowers. Quantity procurement and simplification of maintenance will be achieved as a result of this effort.

e. The efficiency, versatility, and low maintenance of rotary mowers is recognized. However, the inherent dangers must also be recognized. It is not necessary to be near these mowers to be in a danger zone. Blade tip speeds range from 150 to 200 or more miles per hour. Metal objects, wire, broken glass, and rocks hit by rotating blades have proven lethal at a hundred yards. A study of medical reports found 82.5 percent of all mower accidents involved thrown objects.

f. The flail mower has been introduced as an answer to the operating hazards of the rotary mower. A slight decrease in speed or efficiency in some areas is acceptable and preferable to the hazards of the high speed rotary units.

11/ Industrial type sweepers, Code 5700-02, are intended for sweeping shops, hangars, warehouses, and limited areas of paved surfaces outside, such as sidewalks and parking areas. The main broom sweeps a 42-inch swath and with the side brush it sweeps a 53-inch swath. The sweeper is equipped with a vacuum system to control dust. They are highly maneuverable and can be used in aisles five feet or more in width. This type sweeper picks up soilage from fine dust, sand, metal objects, pieces of wire, paper, beverage bottles, etc., at a rate of 40,000 to 60,000 square feet per hour.

12/ Serious difficulties have been encountered in the procurement of self-propelled, tractor mounted, magnetic sweepers. Manufacturers have been reluctant to bid on this special piece of equipment due to the small quantities involved. When bids have been submitted, the prices have been excessive. A 96-inch, two-wheel trailer mounted, permanent magnetic sweeper, Code 5710-01, has been added to the family of equipment. This trailer mounted magnetic sweeper will adequately remove ferrous metal objects from shop areas, parking lots, roadways, runways, etc.

13/ The 3-cubic yard rotary, self-propelled sweeper, Code 5720-01, is for heavy street and runway sweeping operations. The sweeper, equipped with one gutter broom, provides an 8-foot wide sweeping swath. It includes a water storage capacity of 250 gallons and spraying equipment designed to cover the sweeping path ahead of the brushes. Maximum forward sweeping speed is 7 miles per hour and safe traveling speed is 20 to 25 miles per hour.

P-1 LINE ITEM 09
FIREFIGHTING EQUIPMENT

Type Designator	Item Description
7102-01	<u>1/</u> Truck, Aircraft Firefighting and Rescue, 4x4, 11,000 lbs GVW, GED w/special service maintenance body for mounting AFFF-dry chemical twin agent unit fire extinguisher
7160-01	<u>2/</u> Truck, Aircraft Firefighting and Rescue, 4x4, 38,000 lbs GVW, DED, Water/AFFF dispensing, (1000 Gal Water, 130 Gal Foam) TYPE A/S 32 P-17
7160-02	<u>3/</u> Truck, Aircraft Firefighting and Rescue, 4x4, 33,000 lbs GVW, DED (Single Engine), Water/AFFF Dispensing (1000 Gal Water, 200 Gal Foam) Type A/S 32 P-4C
7190-01	<u>4/</u> Truck, Aircraft Firefighting and Rescue, 8x8, 66,800 lbs GVW, DED, Water/AFFF dispensing (2300 Gal Water, 200 Gal Foam), Type A/S 32 P-2R
7195-01	<u>5/</u> Truck, Aircraft Firefighting and Rescue, 8x8, 125,000 lbs GVW, DED (Two Engines), Water/AFFF Dispensing (6000 Gal Water, 500 Gal Foam), TYPE A/S 32 P-15
7321-02	<u>6/</u> Truck, Firefighting, Structural, Pumper, 1,000 GPM, 4x2, DED, 750 gallon water tank, with foam system
7341-02	<u>7/</u> Truck, Firefighting, Brush/Grass Attack Pumper, 250 GPM, 4x4, GED, w/pump and roll capability and on-board 400-gallon water tank
7400-01	<u>8/</u> Truck, Firefighting, Aerial, 100-ft rear-mounted ladder, DED, 4x2, with five-man, enclosed canopy cab

NOTES:

P-1 LINE ITEM 09

1/ The truck mounted, twin agent fire extinguisher unit is intended to be used in applying Aqueous Film Forming Foam (AFFF) firefighting agent in connection with a dry chemical firefighting agent for the purpose of rapidly extinguishing aircraft fires for emergency rescue of flight personnel. The twin agent extinguisher is a self-contained package consisting of two spherical tanks (one tank containing 150 pounds of Purple-K-Powder (PKP) dry chemical, and the other tank containing 200 gallons of AFFF agent) and a manual rewind twin-hose reel with 100 feet of dual agent hose. The unit is mounted on a truck with a special service maintenance body, providing storage compartments for rescue and firefighting equipment.

2/ The 1,000-gallon aircraft firefighting and rescue vehicle is a DED self-contained unit intended for quickly controlling an aircraft crash fire and for the rescue of personnel by dispensing AFFF agent. The main firefighting system consists of a water and foam concentrate tank, a foam dispensing turret mounted on the cab roof, a foam dispensing turret mounted on the bumper, a separate DED pump for the turrets, and appropriate piping and controls. A secondary handline systems that dispenses Halon 1211 for aircraft crash fire and rescue (CFR) is provided. The P-17 also has two 1-1/2 inch preconnected lines for use in both CFR and structural firefighting. The structural mode includes the capability to supply two 2-1/2 inch lines and continuous operation of the foam system from a source other than onboard the truck.

3/ The 1,000-gallon aircraft firefighting and rescue vehicle is the DOD standard family item that is to replace the A/S 32 P-17. It is a single engine, pump and roll vehicle of the same configuration as the P-17 (see description in note 2/). The DOD type designator for this vehicle is A/S 32 P-4C. The structural mode will be limited to water only operations.

4/ The type A/S 32 P-2R is a remanufactured Aircraft Firefighting and Rescue vehicle provided through an Air Force contract to the Navy. The truck is a 8x8 vehicle powered by two diesel engines that provide power to all wheels. The firefighting system consists of water and foam concentrate tanks (2300 gal water and 200 gal AFFF), a foam dispensing turret (300 GPM) mounted in the front bumper, a roof turret (1000 GPM-highflow, 500 CPM-lowflow) and a secondary handline system that is provided with 150 feet of hose to dispense agent at 100 GPM. This vehicle is intended to support CFR missions at category V and larger air activities

5/ The largest CFR vehicle provided to the Navy is the A/S 32 P-15. This vehicle is intended to support CFR missions at special category air activities only. The vehicle has a front and rear diesel engine for vehicle drive and pump operations. The firefighting system consists of a water and foam concentrate tank (6200 gal water and 515 gal foam), front and rear turrets having a discharge rate of 600/1200 GPM each. A handline system provided with 150 ft of hose and nozzle pressure rate of 100 GPM. The front and rear turrets have a discharge rate of 100 GPM. Two water pumps (1250 GPM each) and two foam pumps (180 GPM) are furnished for the front and rear turret systems. These P-15 vehicles are logistically supported by the Air Force with spare parts, technical manuals, and training.

6/ The structural pumper trucks are diesel engine driven and carry a 750-gallon water tank on board to be used with preconnected hose systems during a quick fire attack. Greater personnel protection for firefighters is provided by a five-man canopy cab in place of personnel riding on the rear platform or tailboard. A 1,000-GPM pump mounted amidships is driven by the truck engine. The truck also carries 100 gallons of AFFF agent for use in foaming a hydrocarbon fire. A two section 24 ft. extension ladder, 12 ft. roof ladder with hooks, 10 ft. folding attic ladder and 12 ft. pike pole are also provided.

7/ The small, compact, all-wheel-drive brush/grass unit has one primary applications. It can provide an operational capability for combating off-road brush/grass fires. The brush/grass vehicle is intended to replace the larger and more expensive Code 7341 Structural/Brush/Grass Firefighting Truck and is not intended to replace or be a reserve to the first-line Code 7321 Structural Firefighting 750/1,000 GPM Pumper. The 7341-02 Brush/Grass Vehicle has a rated capacity of 250 GPM, and is capable of pump and roll operations.

8/ The 100-foot rear-mounted aerial ladder truck is intended to be used at large naval shore facilities having multistory, high-rise structures (three or more full stories in height). The truck chassis is a diesel engine driven, front wheel steer, rear wheel drive unit of approximately 39,000-pound GVW equipped with a fully enclosed, low profile, five-man canopy cab. In addition to the 100-foot, four-section aerial ladder, the truck comes equipped with various ground ladders ranging from 10 to 40 feet in length.

P-1 LINE ITEM 10

NOTE: All requirements for weight handling equipment shall be submitted as nonfamily items. Operating requirements shall be submitted in accordance with NAVFACINST 11200.12

**APPENDIX E. GENERAL POLICY OF VEHICLE ASSIGNMENTS TO SPECIAL
SERVICE FUNCTIONS USE OF AUTOMOTIVE VEHICLES**

**Navy Exchange, Commissary Stores, Ships' Stores, Recreation Dept. (Ashore-Afloat)
Messes (Ashore)**

Type of activity and cognizant bureau	General policy
Navy Exchange	<ul style="list-style-type: none"> 1. Owns, operates and maintains vehicles from profits. *2. Has right to use Navy-owned vehicles on a reimbursable basis (1) in emergencies (2) where full time assignment is not required (3) when funds are not available for procurement.
NAVSUP	<ul style="list-style-type: none"> 3. May rent or charter vehicles commercially using nonappropriated funds.
Commissary Stores NAVSUP	<ul style="list-style-type: none"> 1. Generally owns equipment. *2. May utilize activity assigned vehicles when available, on a reimbursable basis.
Ships' Stores NAVSUP	<ul style="list-style-type: none"> 1. Owns no equipment. *2. May utilize activity assigned vehicles when available, on a reimbursable basis. 3. May rent or charter vehicles commercially using nonappropriated funds.
Recreation Dept. (ashore) Recreation Dept. (afloat)	<ul style="list-style-type: none"> 1. May own, operate and maintain vehicles from nonappropriated recreation funds. 2. Free use of Navy-owned vehicles within activity allowance and funding availability is permitted for the purpose of carrying out officially scheduled and sponsored (group) welfare and recreational activities in accordance with the provisions of paragraph 5-7, DOD Reg. 4500.36R. *3. May hire Navy-owned buses on a reimbursable basis where commercial charter services are not available or adequate, or when funds for the free use of Navy-owned vehicles are not available. The hire or use of Navy-owned vehicles for personal recreation is not permissible.
BuPers	<ul style="list-style-type: none"> 4. May rent or charter vehicles commercially using nonappropriated funds.
Messes (ashore)	<ul style="list-style-type: none"> 1. May own, operate and maintain vehicles from nonappropriated funds. 2. Free use of Navy-owned vehicles permitted for official business of the mess when approved by Commanding Officer. *3. Has right to hire Navy-owned vehicles for mess-sponsored (group) recreation on a reimbursable basis when commercial facilities are not available or adequate.
BuPers	<ul style="list-style-type: none"> 4. May rent or charter vehicles commercially using nonappropriated funds.

**Reimbursement.* Labor and material costs incurred by the owning activity for its vehicles (and drivers when provided) which are assigned to the above types of activities will be charged to the using activities in accordance with the accounting procedures under which the owning activity is operating, as prescribed in Volume 3, Chapter 5, Nav Compt Manual.

USN REGISTRATION. All vehicles owned by the above activities or acquired by them from excess personal property listings of the Military Services or any agency of the U.S. Government, shall be identified by USN registration numbers in the 400,000 series. Chapter 8 prescribes procedures for requesting the assignment of USN registration numbers.

APPENDIX F. ALLOWANCE LIST OF SPECIALIZED TRANSPORTATION EQUIPMENT FOR SHIPS

SHIP TYPE	FLIGHT DECK SCRUBBER TYPE 60N Code 5797	TRUCK CRASH FIRE TYPE MB-5 Code 7175 (a)	AIRCRAFT CRASH CRANE TYPE NS-60 Code 8241	HELICOPTER CRASH CRANE TYPE HCC-30 Code 8243
CVT	1	1	1 (b)	
CV 41 & 43	1	1	1	
CV 59, 60, 62, 66, 67	1 (c)	1	1	
CV 61, 63, 64	1	2	1	
CVN 65	1	2	1	
CVN 68, 69	1 (c)	2	1	
LPH 2, 7, 9, 12	1	1		1
LPH 3, 10, 11	1			1
LHA (all)	1			1
LPD (all)				1
NOTES:				
(a) Type MB-5 Crash fire trucks to be replaced by COMNAVAIRSYSCOM managed A/S32P-16 fire fighting truck on CV/CVN and LPH/LHA type ships. Present schedule provided by COMNAVAIRSYSCOM message 151503 Z May 1979.				
(b) Allowance permanently filled with Type NS-50 Aircraft crash crane.				
(c) COMNAVAIRLANT (CINCLANTFLT) has requested an increase in allowance to two scrubbers for each CV/CVN.				

**APPENDIX G. TRANSPORTATION EQUIPMENT CODE LIST ARRANGED BY P-1
LINE ITEM NUMBER BY EQUIPMENT CODE NUMBER**

NAVFAC Equip. Code	NAVFAC Alpha Code	NAVFAC Abbreviated Description	NAVFAC Expanded Long Description	GVW
P-1 LINE ITEM 01 PASSENGER-CARRYING VEHICLES				
0060	B	BUS BOC 12-PASS	BUS, MOTOR, BOC, 12-PASS, AIRPORT, 4X2	
0061	B	BUS BOC 16-20 P	BUS, MOTOR, BOC, 16-20 PASS, 4X2	10,000
0062	B	BUS BOC 29-30 P	BUS, MOTOR, BOC, 29-30 PASS, 4X2	14,000
0063	B	BUS BOC 36-60 P	BUS, MOTOR, BOC, 36-60 PASS, 4X2	19,000
0065	C	BUS BOC 45P F/C	BUS, MOTOR, BOC, 45-PASS, FORWD CON, 4X2 WITHOUT AMBULANCE CONVERSION	24,000
0066	C	BUS BOC 45P F/C	BUS, MOTOR, BOC, 45-PASS, RR LD AMB CONV 4X2, FORWARD CONTROL	
0067	C	BUS BOC 45P F/C	BUS, MOTOR, BOC, 45-PASS, SD LD AMB CONV 4X2, FORWARD CONTROL	
0070	D	BUS INTEG TRANS	BUS, MOTOR, INTEG, 35-47 PASS, DED, CITY TRANSIT, 4X2	
0071	D	BUS INTEG CONVR	BUS, MOTOR, INTEG, 37-47 PASS, W/AMB CON 4X2, DED OR GED	
0102	A	SEDAN INTERM 4D	AUTO, SEDAN, INTERMED, 5-PASS, 4-DR, 4X2	
0103	A	SEDAN SUBCOM 2D	AUTO, SEDAN, SUBCOMPACT, 2-DR, 4X2	
0104	A	SEDAN COMPAC 4D	AUTO, SEDAN, COMPACT, 5-PASS, 4-DR, 4X2	
0105	A	SEDAN LIGHT 4D	AUTO, SEDAN, LIGHT, 5-PASS, 4-DR, 4X2	
0114	A	SEDAN COMPAC 4D	AUTO, SEDAN, COMPACT, LAW ENFORCEMENT 5-PASS, 4-DR, 4X2	
0200	E	STA WAGON LIGHT	AUTO, STA WAGON, LIGHT, 6-8PASS, 4D, 4X2	
0202	E	STA WAG INTERM	AUTO, STA WAGON, INTERMED, 6-8 PASS, 4X2	
0210	E	STA WAG COMPACT	AUTO, STA WAGON, COMPACT, 5-PASS, 4X2	
0220	E	STA WAG SUBCOM	AUTO, STA WAGON, SUBCOMPACT, 2/4-DR, 4X2	
P-1 LINE ITEM 02 TRUCKS				
0098	O	MOBILE MED/DENT	UNIT, MED/DENTAL, MOBILE, SELF-PROP, 4X2 INTEGRAL BUS TYPE	
0099	O	MOBILE MED XRAY	UNIT, X-RAY, MED, MOBILE, SELF-PROP, 4X2	
0205	F	STA WAG AMB CON	AUTO, STA WAGON, W/AMBULANCE CONVER, 4X2	
0297	F	AMBULANCE FORGN	AUTOMOBILE, AMBULANCE, FOREIGN, 4X2	
0299	F	AMBULANCE LIGHT	AUTOMOBILE, AMBULANCE, METRO, 4X2	
0302	O	TRK 1/4-T JEEP	TRUCK, UTILITY, MILITARY, WWII, 4X4	3,500
0305	H	TRK 1/4-T UTIL	TRUCK, UTILITY, COMMERCIAL, 4X4	3,500
0306	F	AMBULANCE LINE	TRUCK, AMBULANCE, FRONT LINE, M-SER, 4X4	3,500
0307	O	TRK 1/4-T UTIL	TRUCK, UTILITY, M-SERIES, W/WO WINCH 4X4	3,500
0308	H	TRK 1/4-T UTIL	TRUCK, UTILITY, COMMERCIAL, 4X2	3,500
0311	H	TRK 1/2-T CARRY	TRUCK, CARRYALL, 8-PASSENGER, 4X2	4,800
0312	H	TRK 1/2-T PANEL	TRUCK, PANEL, 4X2	4,800
0313	G	TRK 1/2T PICKUP	TRUCK, CARGO, PICKUP, 4X2	4,800

NAVFAC Equip. Alpha Code	NAVFAC Abbreviated Code	Description	NAVFAC Expanded Long Description	GVW
0314	F	AMBULANCE CONV	TRUCK, PANEL, AMBULANCE CONVERSION, 4X2	4,800
0315	H	TRK 1/2-T MULTI	TRUCK, MULTISTOP DELIVERY, 4X2	4,800
0316	G	TRK 1/2T PICKUP	TRUCK, CARGO, PICKUP, 4X4	5,000
0317	H	TRK 1/2-T CARRY	TRUCK, CARRYALL, 8-PASSENGER, 4X4	5,000
0318	H	TRK 1/2-T PANEL	TRUCK, PANEL, 4X4	5,000
0319	G	TRK PICKUP COMP	TRUCK, CARGO, PICKUP, COMPACT, 4X2	3,800
0320	O	TRK M-STOP FWDC	TRUCK, MULTISTOP, FORWARD CONTROL, 4X2 SIT/STAND DRIVE, A/C MAINTENANCE	4,000
0322	H	TRK 3/4T PICKUP	TRUCK, CARGO, PICKUP, 4X2	5,800
0325	O	TRK 3/4-T CARGO	TRUCK, CARGO, M-SERIES, W/WO WINCH, 4X4	5,800
0326	H	TRK 3/4T PICKUP	TRUCK, CARGO, PICKUP, 4X4	5,800
0327	H	TRK 3/4T P/U 4D	TRUCK, CARGO, PICKUP, 6M, 4-DR, 4X2	5,800
0328	H	TRK 3/4T P/U 4D	TRUCK, CARGO, PICKUP, 6M, 4-DR, 4X4	5,800
0329	H	TRK PANEL F/C	TRUCK, PANEL, FORWARD CONTROL, GED, 4X2	6,200
0330	H	TRK CARRYAL F/C	TRUCK, CARRYALL, F/C, 8-PASS, GED, 4X2	6,200
0331	F	AMBUL FIELD MIL	TRUCK, AMB, FIELD, MIL, 4-LITTER, 4X4	7,000
0332	F	AMBUL FIELD COM	TRUCK, AMB, FIELD, COM, 4-LITTER, 4X4	10,500
0333	F	AMB CONV COM FC	TRUCK, AMB CONV, COM, 2-LITTER, FC, 4X2	7,500
0334	O	TRK 3/4T WEAPON	TRUCK, UTILITY, WEAPON CARRIER, 4X4	5,800
0335	H	TRK VAN COMP ET	TRUCK, VAN, COMPACT, W/ELEV TOP, FC, 4X2	3,800
0336	O	TRK PAN PAD WAG	TRUCK, PANEL, PADDY WAGON, FC, 4X2	6,200
0341	I	TRK 1-T PANEL	TRUCK, PANEL, 4X2	7,000
0342	I	TRK 1-T PICKUP	TRUCK, CARGO, PICKUP, 4X2	7,000
0343	I	TRK 1-T STAKE	TRUCK, STAKE, 4X2	7,000
0344	I	TRK 1-T CARGO	TRUCK, CARGO, 4X4	7,000
0345	I	TRK 1-T MULTIST	TRUCK, MULTISTOP DELIVERY, 4X2	7,000
0346	O	TRK M-STP FC AM	TRUCK, MULTISTOP, F/C, AIRCRAF MAIN, 4X2 GED	7,000
0348	I	TRK 1-T PICKUP	TRUCK, CARGO, PICKUP, 4X4	7,000
0349	I	TRK 1-T PANEL	TRUCK, PANEL, 4X4	7,000
0350	I	TRK 1-T CARRYAL	TRUCK, CARRYALL, 8-PASSENGER, 4X4	7,000
0352	O	TRK 1-T BOMB	TRUCK, BOMB SERVICE, 4X4	7,000
0355	I	TRK 1-T P/U 4D	TRUCK, CARGO, PICKUP, 6M 4-DR, 4X4	7,500
0360	O	TRK 1-1/4T CARG	TRUCK, CARGO, M-SERIES, W/WO WINCH, 4X4	8,900
0361	F	AMBULANCE HEAVY	TRUCK, AMBULANCE, M-SERIES, 4X4	8,900
0362	I	TRK VAN HI-VOL	TRUCK, VAN, F/C, HI-VOL, 4X2	8,000/ 10,000
0420	J	TRK 1-1/2T MSTP	TRUCK, MULTISTOP DELIVERY, 4X2	14,000
0421	J	TRK 1-1/2 T C&C	TRUCK, CAB & CHASSIS, 4X2	14,000
0423	J	TRK 1-1/2T DUMP	TRUCK, DUMP, 4X2	14,000
0424	J	TRK 1-1/2 T EXP	TRUCK, EXPRESS, 4X2	14,000
0426	J	TRK 1-1/2T STAK	TRUCK, STAKE, 4X2	14,000
0428	J	TRK 1-1/2 T VAN	TRUCK, VAN, 4X2	14,000
0438	O	TRK BOMD SERVIC	TRUCK, BOMB SERV, W/HYD SWING CRANE, 4X4 (MODELS MJ2 & MJ3)	14,000
0439	O	TRK CARGO BOMB	TRUCK, CARGO, BOMB SERVICE, M-SER, 4X4 (MODEL MJ3)	16,000

NAVFAC Equip. Code	NAVFAC Alpha Code	NAVFAC Abbreviated Description	NAVFAC Expanded Long Description	GVW
0441	J	TRK 2-T C&C	TRUCK, CAB & CHASSIS, 4X2	16,000
0443	J	TRK 2-T DUMP	TRUCK, DUMP, 4X2	16,000
0445	J	TRK 2-T STAKE	TRUCK, STAKE, 4X2	16,000
0446	J	TRK 2-T TRACTOR	TRUCK TRACTOR, 4X2	16,000
0449	J	TRK 2-T VAN	TRUCK, VAN, 4X2	16,000
0450	O	TRK 2-T VAN RFG	TRUCK, VAN, REFRIGERATOR, 4X2	16,000
0455	J	TRK 2-T STAKE	TRUCK, STAKE, 4X4	16,000
0456	J	TRK 2-T DUMP	TRUCK, DUMP, 4X4	16,000
0457	J	TRK 2-T VAN	TRUCK, VAN 4X4	16,000
0521	K	TRK 2-1/2 T C&C	TRUCK, CAB & CHASSIS, 4X2	19,000
0523	K	TRK 2-1/2T DUMP	TRUCK, DUMP, 4X2	19,000
0525	K	TRK 2-1/2T STAK	TRUCK, STAKE, GED, 4X2	19,000
0526	K	TRK 2-1/2T TRAC	TRUCK TRACTOR, 4X2	19,000
0527	K	TRK 2-1/2T VAN	TRUCK, VAN, 4X2	19,000
0530	K	TRK 2-1/2T TRAC	TRUCK TRACTOR, DED, 4X2	19,000
0532	O	TRK 2-1/2T CARG	TRUCK, CARGO, WITH OR WITHOUT WINCH, 6X6	19,000
0533	O	TRK 2-1/2T DUMP	TRUCK, DUMP, M-SERIES, 6X6	19,000
0534	O	TRK 2-1/2T STAK	TRUCK, STAKE, 6X6	19,000
0535	O	TRK 2-1/2T TRAC	TRUCK TRACTOR, 6X6	19,000
0536	O	TRK 2-1/2 T VAN	TRUCK, VAN, M-SERIES, 6X6	19,000
0537	O	TRK 2-1/2 T C&C	TRUCK, CAB & CHASSIS, M-SERIES, 6X6	19,000
0539	O	TRK 2-1/2T CARG	TRUCK, CARGO, M-SERIES, W/WO WINCH, 6X6 24-VOLT	19,000
0545	L	TRK 3-1/2T TRAC	TRUCK TRACTOR, 4X2	22,000
0580	M	TRK 5-T DUMP	TRUCK, DUMP, 6X4	34,500
0582	M	TRK 5-T STAKE	TRUCK, STAKE, 6X4	34,500
0583	M	TRK 5-T TRAC DE	TRUCK TRACTOR, DED, 4X2	24,000
0587	O	TRK 5-T DUMP ML	TRUCK, DUMP, M-SERIES, 24-VOLT, 6X6 (M-51)	30,000
0588	O	TRK 5-T CARGO M	TRUCK, CARGO, M-SERIES, 24-VOLT, 6X6 (M-54)	30,000
0590	O	TRK 5-T VAN RFG	TRUCK, VAN, REFRIGERATOR, 4X2	24,000
0591	O	TRK 5-T C&C MIL	TRUCK, CAB & CHASSIS, M-SERIES, 6X6 (M-40)	30,000
0601	M	TRK 5-T C&C	TRUCK, CAB & CHASSIS, 4X2	24,000
0602	M	TRK 5-T DUMP	TRUCK, DUMP, 4X2	24,000
0603	M	TRK 5-T STAKE	TRUCK, STAKE, 4X2	24,000
0604	M	TRK 5-T TRACTOR	TRUCK TRACTOR, 4X2	24,000
0605	M	TRK 5-T VAN	TRUCK, VAN, 4X2	24,000
0606	M	TRK 5-T TRACTOR	TRUCK TRACTOR, 4X4	24,000
0607	O	TRK 5-T TRACTOR	TRUCK TRACTOR, 6X6	36,000
0609	M	TRK 5-T TRACTOR	TRUCK TRACTOR, 6X4	34,500
0613	M	TRK 7-1/2T STAK	TRUCK, STAKE, 6X4/6X6	36,000
0614	M	TRK 7-1/2T TRAC	TRUCK TRACTOR, 4X2/6X2	34,000
0615	O	TRK 7-1/2 T PM	TRUCK, PRIME MOVER, 6X6	34,000
0616	O	TRK 7-1/2T TT Y	TRUCK TRACTOR, YARD SPOTTER, DED, 4X2	32,000
0617	M	TRK 7-1/2T TRAC	TRUCK TRACTOR, 6X4	34,000

NAVFAC Equip. Alpha Code	NAVFAC Abbreviated Code	Description	NAVFAC Expanded Long Description	GVW
0620	M	TRK 10-T TRACTR	TRUCK TRACTOR, 4X2	40,000
0623	M	TRK 10-T TRACTR	TRUCK TRACTOR, DED. 4X2	40,000
0624	M	TRK 10-T VAN	TRUCK, VAN, 4X2	40,000
0625	M	TRK 10-T TRACTR	TRUCK TRACTOR, 4X4	40,000
0630	M	TRK 10-T TRACTR	TRUCK TRACTOR, 6X4	40,000
0631	M	TRK 10-T DUMP	TRUCK, DUMP, 6X4/6X6	45,000
0632	M	TRK 10-T STAKE	TRUCK, STAKE, 6X4	40,000
0633	M	TRK 10-T TRACTR	TRUCK TRACTOR, DED, 6X4	44,500
0636	M	TRK 10-T STAKE	TRUCK, STAKE, DED, 6X4	40,000
0638	N	TRK 15-T TRACTR	TRUCK TRACTOR, 6X6	48,000
0643	N	TRK 15-T STAKE	TRUCK, STAKE, 6X4	45,000
0644	N	TRK 15-T DUMP	TRUCK, DUMP, 6X4/6X6	50,000
0645	N	TRK 15-T TRACTR	TRUCK TRACTOR, 6X4	51,000
0649	N	TRK 25-T TRACTR	TRUCK TRACTOR, DED, 6X4 (25-TON)	64,000
0701	O	TRK CARGO AMPHI	TRUCK, CARGO, AMPHIBIAN, CRWLR/PRT SWAMP BUGGY	
0704	O	TRK AMMO HNDLG	TRUCK, AMMUNITION, W/HYD CRANE, 4X2/4X4	24,000
0707	Q	TRK A/FLD MAINT	TRUCK, AIRFIELD MAINT/AMMO TRANSPORTER	
0708	O	TRK PLATFM UTIL	TRUCK, PLATFORM, UTILITY, 3 OR 4-WHEEL, GED/EMD, 250 TO 1,000-LB PAYLOAD CAPACITY	
0709	O	TRK FLD SERVNG	TRUCK, FIELD SERVICING WITH COMPLETE LUBRICATION & FUEL SERVICE EQUIPMENT	16,000
0710	O	TRK LUBRICATION	TRUCK, LUBRICATION SERVICE	
0711	O	TRK ARMORED	TRUCK, ARMORED (PAYROLL)	
0713	O	TRK TIRE SERVNG	TRUCK, TIRE SERVICING	19,000
0715	O	TRK MULTI-PURP	TRUCK, MULTIPURP, PIPELINE CONST, M-SER M45/M45A2 CHASSIS (SPECIAL FEATURES: CARGO, PERSONNEL CARRIER, OR FLATBED WITH "A" FRAME)	19,000
0717	O	TRK VAN REFRIG	TRUCK, VAN, REFRIGERATOR (EXCEPT CODES 0450 AND 0590)	
0719	O	TRK FOOD/BEVRGE	TRUCK, FOOD/BEVERAGE, WINDOW SERVICE	
0722	O	TRK UTIL MAINT	TRUCK, MAINT, TELEPHONE/UTILITY, 4X2/4X4	8,400
0723	O	TRK P&L CONSTR	TRUCK, MAINT, POLE/LINE CONSTR, GED, 4X2	16,000
0724	O	TRK STAKE W/LDR	TRUCK, STAKE/PICKUP, W/LADDER, GED, 4X2 HAND OPERATED (NOT FIRE TRUCK)	16,000
0725	O	TRK OVRHD MAINT	TRUCK, OVRHD MAINT, AERIAL SERV PLTFM W/HYDR BOOM	24,000
0730	O	TRK WRECKER	TRUCK, WRECKER, COMMERCIAL/M-SERIES	24,000
0731	Q	TRK LDR AC HILF	TRUCK, LODR, A-C, W/WINCH/RAMP, HI-LIFT 2-9 TON (SPECIAL WEAPONS)	39,500
0732	O	TRK CARG HILIFT	TRUCK, CARGO, HIGHLIFT	
0733	O	TRK DUMP HILIFT	TRUCK, DUMP, HIGHLIFT	
0734	O	CARRIER PERSONN	TRUCK, CARRIER, PERSONNEL, TRACKED (CONV	

NAVFAC Equip. Code	Alpha Code	NAVFAC Abbreviated Description	NAVFAC Expanded Long Description	GVW
0735	O	TRK REEL PWRD	TRUCK, REEL HANDLING/TENSIONING, POWERED	
0738	O	TRK FLTBD OILFL	TRUCK, FLATBED, OILFIELD	
0739	O	TRK FLTBD OILFL	TRUCK, FLATBED, OILFIELD, COMM, 4X2/6X4	34,500
0740	O	TRK FLATBED	TRUCK, FLATBED, 4X4	17,000
0742	O	TRK TANK GEN PU	TRUCK, TANK, W/O GAGES, GP, 500-999 GAL (WATER, REGULAR GAS, DIESEL, ETC.)	
0743	Q	TRK TNK AV LUBE	TRUCK, TANK, AVLUBE OIL DISPEN, 500-599G WITH OR WITHOUT HEATING ELEMENT	16,000
0744	Q	TRK TNK AVGAS/J	TRUCK, TANK, AVGAS/JET, 1000-1499 GAL	
0746	O	TRK TANK GEN PU	TRUCK, TANK, W/O GAGES, GP, 1000-1499G (WATER, REGULAR GAS, DIESEL, ETC.)	
0750	Q	TRK TNK AVGAS/J	TRUCK, TANK, AVGAS/JET, 2000-2999 GAL	
0751	O	TRK TANK GEN PU	TRUCK, TANK, W/O GAGES, GP, 2000-2999G (WATER, REGULAR GAS, DIESEL, ETC.)	28,000
0752	Q	TRK TNK AVGAS/J	TRUCK, TANK, AVGAS/JET, 3000-4999 GAL	
0753	O	TRK TANK 3000 G	TRUCK, TANK, W/O GAGES, GP, 3000-GAL/UP (WATER, REGULAR GAS, DIESEL, ETC.)	
0754	O	TRK TANK FUEL	TRUCK, TANK, FUEL, 2200-GAL, 6X4	30,000
0756	Q	TRK TNK AVGAS/J	TRUCK, TANK, AVGAS/JET, 6X4, 5000-GAL/UP	56,000
0757	O	TRK TANK WATER	TRUCK, TANK, WATER, 1000-1499 GALLONS	
0758	O	TRK TANK WATER	TRUCK, TANK, WATER, 2000-2999 GALLONS	
0759	O	TRK TANK WATER	TRUCK, TANK, WATER, 3000-GALLONS & UP	
0902	Z	MOTORCYCLE 2WHL	MOTORCYCLE, SOLO, 2-WHEEL	
0903	Z	MOTORCYCLE 3WHL	MOTORCYCLE, PACKAGE DELIVERY, 3-WHEEL WITH SIDE CAR (ALSO SERVICE VEHICLE)	
0905	Z	SCOOT PK 3-4WHL	SCOOTER, MOTOR, PKG DELIVERY, 3-4 WHEEL WITH SIDE CAR	
0907	Z	SLED SNOWMOBILE	SLED, SELF-PROP, GED, SNOWMOB, SKI-STEER	
5820	S	TRK COMPAC 16CY	TRUCK, REF COLL, COMPACTION 16-25 CU YD	39,500
5830	S	TRK HOIST/HAUL	TRUCK, REF COLL, HOIST/HAUL, 2-12 CU YD	
5831	S	TRK HOIST/FKLFT	TRUCK, REF COLL, HOIST, FORKLIFT, G/DED	32,000
5833	S	TRK H/H TO 45CY	TRUCK, REF COLL, HOIST/HAUL TO 45-CU YD	51,000
5835	S	TRK HOIST/COMP	TRUCK, REF COLL, COMPACT, W/HOIST, 24-CY	39,500

P-1 LINE ITEM 03 TRAILERS				*Payload lbs
0090	P	SEMI W/PAS CONV	SEMITRAILER, W/PASSENGER BUS CONVERSION	14,000
0800	P	TRLR 1T 2W MAIN	TRAILER, MAINTENANCE, UTILITY, 2-WHEEL	* 1,000/ 2,000
0801	P	TRLR 1/4T 2W CG	TRAILER, CARGO, 2-WHEEL	* 500/ 1,999
0802	P	TRLR 1T 2W CARG	TRAILER, CARGO, 2-WHEEL	* 2,000/ 2,999
0803	P	TRL LUBE SERVIC	TRAILER, LUBRICATION SERVICE	
0804	P	TRLR 1-1/2T 2WH	TRAILER, CARGO, 2-WHEEL	* 3,000/ 3,999
0805	P	TRLR 2-5T 2-4WH	TRAILER, 2 OR 4-WHEEL	* 4,000/ 10,000

NAVFAC	NAVFAC			
Equip.	Alpha	Abbreviated		
Code	Code	Description	NAVFAC Expanded Long Description	*Payload lbs
0808	P	TRLR MAINT PLAT	TRAILER, MAINTENANCE PLATFORM, HYDRAULIC	
0809	P	SEMI LOWBED HYD	SEMITRAILER, LOWBED, HYDRL DROP TABLE (WITH OR WITHOUT)	
0810	P	SEMI 10-T STAKE	SEMITRAILER, STAKE, 1-AXLE	* 20,000
0811	P	SEMI 10-T VAN	SEMITRAILER, VAN, 1-AXLE	* 20,000
0812	P	SEMI 14-T STAKE	SEMITRAILER, STAKE, 1 OR 2-AXLE	* 22,000/ 28,000
0813	P	SEMI 12-T VAN	SEMITRAILER, VAN, 1 OR 2-AXLE	* 24,000
0814	P	SEMI 19-T STAKE	SEMITRAILER, STAKE, 1 OR 2-AXLE	* 38,000
0815	P	SEMI 19-T VAN	SEMITRAILER, VAN, 2-AXLE	* 38,000
0816	P	SEMI 20-T STAKE	SEMITRAILER, STAKE, 2-AXLE	* 40,000
0817	P	SEMI 20-T VAN	SEMITRAILER, VAN, 2-AXLE	* 40,000
0818	P	SEMI 40-T STAKE	SEMITRAILER, STAKE, 2-AXLE	* 80,000
0819	P	SEMI 12T VAN RF	SEMITRAILER, VAN, REFRIGERATOR, 1-2 AXLE	* 24,000
0820	P	SEMI 20T VAN RF	SEMITRAILER, VAN, REFRIGERATOR, 2-AXLE	* 40,000
0821	P	SEMI 14-T LOBED	SEMITRAILER, LOWBED, 4-WHEEL	* 28,000
0822	P	SEMI 20-T LOBED	SEMITRAILER, LOWBED, 4-WHEEL	* 40,000
0823	P	SEMI 25-T LOBED	SEMITRAILER, LOWBED, 4-WHEEL	* 50,000
0824	P	SEMI 30-T LOBED	SEMITRAILER, LOWBED, 4-WHEEL	* 60,000
0825	P	SEMI 35-T LOBED	SEMITRAILER, LOWBED, 2-AXLE	* 62,000/ 70,000
0826	P	SEMI 50-T LOBED	SEMITRAILER, LOWBED, TRUNNION AXLE	* 100,000
0827	P	SEMI 60-T LOBED	SEMITRAILER, LOWBED, TRUNNION AXLE	* 120,000
0828	P	SEMI 75-T LOBED	SEMITRAILER, LOWBED, TRUNNION AXLE, 8WHL	* 150,000
0829	P	DOLLY TRLR CONV	DOLLY, TRAILER CONVERTER	
0830	P	TRLR 14-T STAKE	TRAILER, STAKE, 1-AXLE	* 28,000
0831	P	TRLR 14-T VAN	TRAILER, VAN, 1-AXLE	* 28,000
0833	P	TRLR 14-T LOBED	TRAILER, LOWBED, 4-WHEEL	* 28,000
0834	P	TRLR 20-T LOBED	TRAILER, LOWBED, 4-WHEEL	* 40,000
0835	P	TRLR 25-T LOBED	TRAILER, LOWBED, 4-WHEEL	* 50,000
0839	P	TRLR 60-T LOBED	TRAILER, LOWBED, 8-WHEEL	* 120,000
0840	P	TRLR 85-T LOBED	TRAILER, LOWBED, 8-WHEEL	* 170,000
0841	P	TRLR 20-T STAKE	TRAILER, STAKE, 2-AXLE	* 40,000
0842	P	TRLR 15-T BOLST	TRAILER, BOLSTER, PIPE/POLE	* 30,000
0843	P	TRLR 5-T CRL/PL	TRAILER, CABLE REEL/POLE	* 10,000
0844	P	TRLR FILTERING	TRAILER, FILTERING, PORTABLE	
0845	P	TRLR 1/4T CA SP	TRAILER, MAINTENANCE, CABLE SPLICER	
0848	T	TRLR/SEMI DUMP	TRAILER/SEMITRAILER, DUMP, REFUSE	
0852	P	TRLR MAINT TELE	TRAILER, MAINTENANCE, TELEPHONE	
0853	P	TRLR/SEMI MISC	TRAILER/SEMITRAILER, MISC/EXHIBIT/TRNG RECRUITING/GENERAL SERVICE/UTILITY, ETC.	
0855	P	TRLR DENT PR/OP	TRAILER, DENTAL, PREVENTIVE/OPERATING	
0856	P	SEMITRLR DENTAL	SEMITRAILER, DENTAL UNIT	
0857	P	TRLR SHOWER BTH	TRAILER, SHOWER BATH	
0858	P	TRLR STOCKROOM	TRAILER, VAN, STOCKROOM	
0859	P	TRLR P DENT TRT	TRAILER, PREVENTIVE DENTISTRY TREATMENT	
0862	P	TRLR TILTDECK	TRAILER/SEMITRAILER, TILTDECK, LOWBED 2 OR 4-WHEEL	* 12,000/ 28,000
0864	P	TRLR DEHUMID	TRAILER, DEHUMIDIFIER	

NAVFAC Equip. Alpha Code	NAVFAC Abbreviated Code	Description	NAVFAC Expanded Long Description	GVW
0880	P	TRLR TANK 400-G	TRAILER, TANK, W/O GAGE/PUMP, 2WHL, 400G GENERAL PURPOSE (WATER, REGULAR GAS, DIESEL, OIL SALVAGE, ETC.)	1,500
0881	P	TRLR TNK 5/600G	TRAILER, TNK, W/O GAG/PUMP, 2-4W, 5/600G GENERAL PURPOSE (WATER, REGULAR GAS, DIESEL, OIL SALVAGE, ETC.)	
0882	P	TRLR TANK 600-G	TRAILER, TNK, W/PUMP, 2-4 WHEEL, 600-GAL GENERAL PURPOSE (WATER, REGULAR GAS, DIESEL, OIL SALVAGE, ETC.)	
0883	P	TRLR TANK 500-G	TRAILER, TANK, W/O GGS, 2-4 WHL, TO 500G GENERAL PURPOSE (WATER, REGULAR GAS, DIESEL, OIL SALVAGE, ETC.)	
0884	P	SEMI TNK 1-2K G	SEMITRAILER, TANK, W/O GAGES, 1000-1999G GENERAL PURPOSE (WATER, REGULAR GAS, DIESEL, ETC.)	
0886	P	SEMI TNK 2-3K G	SEMITRAILER, TANK, W/O GAGES, 2000-2999G GENERAL PURPOSE (WATER, REGULAR GAS, DIESEL, ETC.)	
0887	Q	SEMI TNK 2-3K G	SEMITRAILER, TANK, AVGAS/JET, 2000-2999G	
0888	P	SEMI TNK 3-4K G	SEMITRAILER, TANK, W/O GAGES, 3000-3999G GENERAL PURPOSE (WATER, REGULAR GAS, DIESEL, ETC.)	
0890	P	SEMI TNK 4-6K G	SEMITRAILER, TANK, W/O GAGES, 4000-5999G GENERAL PURPOSE (WATER, REGULAR GAS, DIESEL, ETC.)	
0891	Q	SEMI TNK 4KUP G	SEMITRAILER, TANK, AVGAS/JET, 4000-G UP	
0892	P	SEMI TNK 6KUP G	SEMITRLR, TANK, GP, W/O GAGES, 6000-G UP GENERAL PURPOSE (WATER, REGULAR GAS, DIESEL, ETC.)	
0898	P	SEMI LB W/WINCH	SEMITRAILER, LOWBED, W/GED WINCH ON GSNC (MINE TRANSPORTER)	
5840	T	SEMI/TRLR REFUS	SEMITRAILER/TRAILER, REFUSE COLLECTION	
5842	T	SEMI REFUSE CMP	SEMITRAILER, REFUSE COLLECT, COMPACTION	

NOTE: For reference purposes the tonnage cross reference to Gross Vehicle Weight (GVW) may be converted approximately as follows:

Truck, 1/2 ton, 4x2	4,800 GVW
Truck, 1/2 ton, 4x4	5,000 GVW
Truck, 3/4 ton, 4x2 or 4x4	5,800 GVW
Truck, 1 ton, 4x2 or 4x4	7,000 GVW
Truck, 1 1/2 ton, 4x2 or 4x4	14,000 GVW
Truck, 2 ton, 4x2 or 4x4	16,000 GVW
Truck, 2 1/2 ton, 4x2 or 4x4	19,000 GVW
Truck, 3 ton, 4x2	21,000 GVW
Truck, 5 ton, 4x2 or 4x4	24,000 GVW
Truck, 5 ton, 6x4	30,000 GVW
Truck, 6 ton, 4x2	28,000 GVW

Truck, 7-7 1/2 ton, 4x2	32,000 GVW
Truck, 7-7 1/2 ton, 4x4	34,000 GVW
Truck, 10 ton, 4x2, 4x4, or 6x4	40,000 GVW
Truck, 15 ton, 6x4	45,000 GVW
Truck, 20 ton, 6x4	51,000 GVW

NAVFAC Equip. Code	Alpha Code	NAVFAC Abbreviated Description	NAVFAC Expanded Long Description
P-1 LINE ITEM 04 CRUSHING, MIXING, BATCHING, & GVW PAVING EQUIPMENT			
2110	T	PLANT BATCHING	PLANT, BATCHING, AGGREGATE
2111	T	UNIT GRAD CNTRL	UNIT, GRADATION CONTROL, AGGREGATE
2120	T	PLANT BATCHING	PLANT, BATCHING, CEMENT/CEMENT W/AGGREGATE
2130	T	BIN STORAGE AGG	BIN, STORAGE, AGGREGATE, W/WO SCALES
2200	T	CRUSHER ROCK	CRUSHER, ROCK & SCREEN PLT, PORT, 2-UNIT
2210	T	PLANT WASHING	PLANT, WASHING, AGGREGATE, SAND/GRAVEL
2220	T	FEEDER AGGREG	FEEDER, AGGREGATE, CONVEYOR OR PORTABLE
2225	T	FEEDER FINES BI	FEEDER, FINES, BITUMINOUS MIX (E.G., BARBER GREEN MODEL 811A OR EQUAL)
2300	S	FINISHER ASPHLT	FINISHER, PAVING, ASPHALT
2325	T	PAVER CURB	PAVER, CURB
2340	T	GRINDER CONCRT	GRINDER, PAVEMENT, CONCRETE, SELF-POWER
2410	T	MIXER ASPHALT	MIXER, ASPHALT PLANT
2415	T	MIXER ROAD MAT	MIXER, ROAD MATERIAL, ASPHALT, S-P/TOWED WITH OR WITHOUT DRYER
2416	T	MIX-SPRD SLURRY	MIXER-SPREADER, BITUM SLURRY, TRUCK MTD (ASPHALT PAVEMENT SEALING MACHINE)
2417	T	MIXER ROAD STAB	MIXER, ROAD MTRL STABILIZER, S-P/TOWED
2420	S	MIXER TRANSIT	MIXER, TRANSIT, CONCRETE, TRUCK MOUNTED
2425	T	PLANT CONCRETE	PLANT, CONCRETE, MIX/BATCH, COMPLT, TRLR
2430	S	MXR CONCR LT3½S	MIXER, CONCRETE, PORTABLE, UNDER 3½-S
2431	S	MXR CONCR 3½-SK	MIXER, CONCRETE, PORTABLE, 3½-S (CU FT)
2432	S	MXR CONCR 7-SK	MIXER, CONCRETE, PORTABLE, 6-7 S (CU FT)
2433	S	MXR CONCR 11-SK	MIXER, CONCRETE, PORTABLE, 10-11 S (CFT)
2434	S	MXR CONCR 16-SK	MIXER, CONCRETE, PORTABLE, 14-16 S (CFT)
2462	T	CONCR SPRA/SNBL	SPRAYER/SANDBLASTER, CONCRETE, W/WO MXR, PUMP, CONCRETE (CEMENT) GUN
2470	S	SAW CONCRETE SP	SAW, CONCRETE, SELF-POWERED
2520	S	DISTRIB ASPHALT	DISTRIBUTOR, ASPHALT, TRUCK/TRAILER MTD
2521	S	DISTRIB WATER	DISTRIBUTOR, WATER, TRUCK OR TRAILER MTD 28,000 STREET FLUSHER OR SPRINKLER
2522	T	BUGGY CONCRETE	BUGGY, CONCRETE, SELF-PROPELLED
2530	T	SPREADR AGG TWD	SPREADER, ROCK AND AGGREGATE, TOWED
2535	S	SPREADR AGG S-P	SPREADER, AGGREGATE, SELF-PROPELLED, PRT
2540	T	SPRDR LOOSE MAT	SPREADER, LOOSE MATERIAL, TOWED
2542	T	SPRDR CEM/LIME	SPREADER, CEMENT/LIME, SELF-PROPELLED GED/DED, 6" TO 150" SPREAD WIDTH
2610	T	CONVEYOR BELT	CONVEYOR, AGGREGATE, BELT OR TROUGH

NAVFAC Equip. Code	Alpha Code	NAVFAC Abbreviated Description	NAVFAC Expanded Long Description
2615	T	ELEVATOR BUCKET	ELEVATOR, BUCKET, HOT OR COLD AGGREGATE
2620	T	PUMP CONCRETE	PUMP, CONCRETE
2625	T	BOOM/SLICK LINE	BOOM, WITH SLICK LINE, TRUCK MOUNTED (FOR USE WITH CONCRETE PUMP)
2720	T	DRYER AGGREGATE	DRYER, AGGREGATE, ASPHALT PLANT
2730	T	BOILER ASPH HTR	BOILER, ASPHALT HTR, TANK CAR, 28-42 HP TRAILER MOUNTED
2735	T	HEATER ASP TOOL	HEATER, ASPHALT TOOL, TRAILER MOUNTED
2740	T	KETTLE BITUMEN	KETTLE, HEATING, BITUMEN, SKID/TRLR MTD
2745	T	HEAT-PLANE R/S	HEATER-PLANER, ROAD SURFACE, SELF-PROPEL
2750	T	TANK ASPHALT	TANK, ASPHALT STORAGE, TRUCK OR TRLR MTD
2760	T	KETTLE JOINT SL	KETTLE, HEATING, RUBBERIZED JOINT SEALER
2840	T	GROUTER MUD JAK	GROUTER, MUD JACK

**P-1 LINE ITEM 05
DRILLING AND BLASTING EQUIPMENT**

3100	S	COMPRES 104-CFM	COMPRESSOR, AIR, PORTABLE, 60-104 CFM 100 LB PRESSURE, SKID/TRAILER/TRUCK MOUNTED
3110	S	COMPRES 125-CFM	COMPRESSOR, AIR, PORTABLE, 105-125 CFM 100 LB PRESSURE, SKID/TRAILER/TRUCK MOUNTED
3111	S	TRAC/CMP 125CFM	TRACTOR AIR COMPRESSOR, PRT, 125-CFM 100 LB PRESSURE
3130	S	COMPRES 210-CFM	COMPRESSOR, AIR, PORTABLE, 210-CFM 100 LB PRESSURE, SKID/TRAILER/TRUCK MOUNTED
3135	S	COMPRES 250-CFM	COMPRESSOR, AIR, PORTABLE, 250-CFM 100 LB PRESSURE, SKID/TRAILER/TRUCK MOUNTED
3150	S	COMPRES 315-CFM	COMPRESSOR, AIR, PORTABLE, 315-CFM 100 LB PRESSURE, SKID/TRAILER/TRUCK MOUNTED
3155	S	COMPRES 365-CFM	COMPRESSOR, AIR, PORTABLE, 365-CFM 100 LB PRESSURE, SKID/TRAILER/TRUCK MOUNTED
3160	S	COMPRES 500-CFM	COMPRESSOR, AIR, PORTABLE, 500-CFM 100 LB PRESSURE, SKID/TRAILER/TRUCK MOUNTED
3165	S	COMPRES 600-CFM	COMPRESSOR, AIR, PORTABLE, 600-CFM/UP 100 LB PRESSURE, SKID/TRAILER/TRUCK MOUNTED

NAVFAC Equip. Code	Alpha Code	NAVFAC Abbreviated Description	NAVFAC Expanded Long Description
3530	T	DRILL PNEU DRIF	DRILL, PNEUMATIC DRIFT, WAGON, AUTO FEED
3531	S	DRILL CORE	DRILL, CORE, SKID/TRAILER/TRUCK MOUNTED
3532	S	DRILL PNEU DRIF	DRILL, PNEUMATIC DRIFT, CRAWLER MTD
3630	T	DRIVER PILE S-C	DRIVER, PILE, SELF-CONTAINED
3710	S	AUGER EARTH	AUGER, EARTH, VER/HOR, SKD/TRLR/TRK/TRKD
3720	S	DRILL ROT/PERC	DRILL, WELL, ROTARY/PERCUSSION

**P-1 LINE ITEM 06
EARTH MOVING EQUIPMENT**

4230	S	CRANE CRWLR 10T	CRANE, CRAWLER, DED, 7-10 TON, 3/4 CY
4240	S	CRANE CRWLR 30T	CRANE, CRAWLER, DED, 20-30 TON, 1-1/2CY
4250	S	CRANE CRWLR 40T	CRANE, CRAWLER, DED, 30-40 TON 1-3/4-2CY
4260	S	CRANE CRWLR 60T	CRANE, CRAWLER, DED, 45-60 TON, 2-1/2CY
4270	S	CRANE CRWLR 75T	CRANE, CRAWLER, DED, 65-75 TON, 3-4 CY
4305	T	CABLE LAYER UG	CABLE LAYER, UNDERGROUND, TOWED
4310	S	DITCHER WHL/LDR	DITCHER, WHEEL/LADDER, WHEEL/CRAWLER MTD
4320	T	ROOTER/HARROW	ROOTER, ROAD; HARROW, DISC, TOWED
4330	S	EXCAVATOR W/TBM	EXCAVATOR, MULTIPUR, W/TEL BOOM, TRK MTD (E.G., GRADALL)
4340	S	EXCAVATOR B/HOE	EXCAVATOR, HYDRAUL BACKHOE, CRAWLER MTD
4410	T	GRADER RD TOWED	GRADER, ROAD, TOWED
4420	S	GRADER RD MOTOR	GRADER, ROAD, MOTORIZED, GED/DED
4530	S	LOADER FULL-TRK	LOADER, SCOOP, FULL-TRACK, SHOVEL DOZER
4531	S	LOADER SCOOP WH	LOADER, SCOOP, WHEEL MOUNTED
4540	S	LOADER SNOW	LOADER, SNOW, BELT/BUCKET, CRWLR/WHL MTD
4610	T	ROLLER Wobble	ROLLER, Wobble WHEEL, PNEUMATIC TIRE
4615	S	ROLLER OSCIL SP	ROLLER, OSCILLATING, SELF-PROPELLED, PRT
4620	T	ROLLER SHEEPSFT	ROLLER, SHEEPSFOOT, TAMPING, TOWED
4621	T	ROLLER GRID TWD	ROLLER, GRID, TOWED
4622	S	ROLLER GRID/SEG	ROLLER, GRID/SEGMENTED, SELF-PROPELLED
4625	T	COMPACTOR VBR	COMPACTOR, VIBRATOR, EARTH OR AGGREGATE
4630	S	ROLLER TANDEM	ROLLER, ROAD, TANDEM, S-P, ALL SIZES
4635	S	ROLLER VIBRATE	ROLLER, ROAD, VIBRATING, S-P, ALL SIZES
4640	S	ROLLER 3-WHEEL	ROLLER, ROAD, 3-WHEEL, S-P, ALL SIZES
4710	T	SCRAPER TWD 5CY	SCRAPER, CARRYALL, CABL/HYD, TWD, 3-5 CY
4730	T	SCRAPR TWD 12CY	SCRAPER, CARRYALL, CABL/HYD, TWD, 12-CY AND UP
4731	T	SCRAPR TWD 18CY	SCRAPER, CARRYALL, 2-WH UNV HCH, 14-18CY TOWED, WITHOUT DOLLY
4750	S	TRAC-SCRPR 24CY	TRACT-SCRPR, INTG, S-P, 1-2 ENG, 15-24CY
4760	S	TRK DUMP OFF-HI	TRUCK, DUMP, OFF-HIGHWAY
4770	T	TRLR DUMP EARTH	TRAILER, DUMP, EARTH-MOVE, WHL/CRWLR MTD
4805	S	TRAC/DUMP TRLR	TRACTOR, 2-WHL, W/DUMP TRLR, 15-30 TON INTEGRAL
4809	S	TRC CRAWLR 10HP	TRACTOR, CRAWLER, GED/DED, 10 DBHP WITH OR WITHOUT ATTACHMENTS

NAVFAC Equip. Code	Alpha Code	NAVFAC Abbreviated Description	NAVFAC Expanded Long Description
4810	S	TRC CRAWLR 34HP	TRACTOR, CRAWLER, GED/DED, 10-34 DBHP WITH OR WITHOUT ATTACHMENTS
4820	S	TRC CRAWLR 49HP	TRACTOR, CRAWLER, GED/DED, 35-49 DBHP WITH OR WITHOUT ATTACHMENTS
4830	S	TRC CRAWLR 74HP	TRACTOR, CRAWLER, GED/DED, 50-74 DBHP WITH OR WITHOUT ATTACHMENTS
4840	S	TRC CRWLR 109HP	TRACTOR, CRAWLER, GED/DED, 75-109 DBHP WITH OR WITHOUT ATTACHMENTS
4850	S	TRC CRWLR 179HP	TRACTOR, CRAWLER, GED/DED, 110-179 DBHP WITH OR WITHOUT ATTACHMENTS
4851	S	TRC CRWLR 180UP	TRACTOR, CRAWLER, GED/DED, 180-DBHP & UP WITH OR WITHOUT ATTACHMENTS
4860	S	TRC GARDEN 14HP	TRACTOR, WHEEL, PRT, GARDEN, TO 14 HP
4865	S	TRAC W/AER PLAT	TRACTOR, WITH AERIAL SERVICING PLATFORM
4872	U	TRC WH IND 12HP	TRACTOR, WHL, PRT, IND, GED, 9-19 DBHP
4873	U	TRC WH IND 29HP	TRACTOR, WHL, PRT, IND, GED, 20-29 DBHP
4874	U	TRC WH IND 30HP	TRACTOR, WHL, PRT, IND, GED, 30-39 DBHP
4875	U	TRC WH IND 50HP	TRACTOR, WHL, PRT, IND, GED, 40-49 DBHP
4876	U	TRC WH IND 51UP	TRACTOR, WHL, PRT, IND, GED, MIN 50-DBHP
4877	U	TRC WH IND MOWR	TRACTOR, WHL, IND, W/AMMO MOWER, 30-DBHP 4X2, TERRA TIRES, LOW PROFILE FOR AMMO MAGAZINES
4878	Q	TRC WH IND G&E	TRACTOR, WHL, IND, GND SUP EQUIP, AIRFLD
4891	S	TRC WH 14K PDBP	TRACTOR, WHEEL, INDUST, 7800-14000 PDBP 4-WHEEL DRIVE PRIME MOVER
4892	S	TRC WH 20K PDBP	TRACTOR, WHEEL, INDUST, 14001-20000 PDBP
4893	S	TRC WH 27K PDBP	TRACTOR, WHEEL, INDUST, 20001-27000 PDBP
4894	S	TRC WH OVER 27K	TRACTOR, WHEEL, INDUST, 27001 PDBP & UP

P-1 LINE ITEM 07
LIGHTING AND POWER GENERATION EQUIPMENT

5110	T	FLOODLIGHT ELEC	FLOODLIGHT, ELEC, TRUCK/TRLR MTD (GENERATOR)
5113	Q	FLDLIGHT AIRFLD	FLOODLIGHT, AIRFIELD, TRAILER
5120	T	GENERATOR 5-9KW	GENERATOR, PORTABLE, GED/DED, 5-9 KW SKID/TRUCK/TRAILER MOUNTED (EXCEPT GENERATORS FOR ELECTRONICS)
5121	T	GENERATOR 10-15	GENERATOR, PORTABLE, GED/DED, 10-15 KW SKID/TRUCK/TRAILER MOUNTED (EXCEPT GENERATORS FOR ELECTRONICS)
5122	T	GENERATOR 16-30	GENERATOR, PORTABLE, GED/DED, 16-30 KW SKID/TRUCK/TRAILER MOUNTED (EXCEPT GENERATORS FOR ELECTRONICS)

NAVFAC Equip. Code	Alpha Code	NAVFAC Abbreviated Description	NAVFAC Expanded Long Description
5123	T	GENERATOR 31-59	GENERATOR, PORTABLE, GED/DED, 31-59 KW SKID/TRUCK/TRAILER MOUNTED (EXCEPT GENERATORS FOR ELECTRONICS)
5124	T	GENERATOR 60-100	GENERATOR, PORTABLE, GED/DED, 60-100 KW SKID/TRUCK/TRAILER MOUNTED (EXCEPT GENERATORS FOR ELECTRONICS)

P-1 LINE ITEM 08
MISCELLANEOUS CONSTRUCTION AND
MAINTENANCE EQUIPMENT

5160	Z	LUBRICATOR PWR	LUBRICATOR, POWER OPERATED, SKID MTD
5170	S	WELDER ARC ELEC	WELDER, ARC, ELEC, GED/DED, SKID/TRLR MT
5171	S	WELDER ARC S-P	WELDER, ARC, ELECTRIC, SELF-PROPELLED
5220	T	PUMP CENTRIFUGL	PUMP, CENTRIFUGAL, 4-INCH OR GREATER
5230	T	PUMP SUMP PORT	PUMP, SUMP, PORTABLE, GED/DED
5240	T	PUMP ROTARY POR	PUMP, ROTARY, PORTABLE, GED/DED
5300	T	DISTRIB BITUMIN	DISTRIBUTOR, BITMINOUS MATRL, TANKLESS SKID/TRAILER MOUNTED
5405	S	CLEANR VAC LEAF	CLEANER, VAC, LEAF/LITTER, TRK/TRLR MTD
5408	S	CLEANER VAC A/F	CLEANER, VACUUM, AIRFIELD, SELF-PROPEL
5409	S	CLEANER VAC/HYD	CLEANER, BASIN/MANHOLE, VAC/HYD, TRK MTD
5410	Z	CLEANER STEAM	CLEANER, STEAM, HI-PRESS, SKID/TRLR MTD JENNY
5411	T	CLEANER JOINT	CLEANER, JOINT, PAVING
5412	S	CLEANER AUGER	CLEANER, PIPE/SEWER, AUGER/CABLE, TRLR
5413	T	CLEANER SCRAPER	CLEANER, SCRAPER, PORTABLE
5414	S	CLEANER SEP TNK	CLEANER, SEPTIC TANK/CESSPOOL, TRUCK MTD TANK WITH SLUDGE PUMP
5416	S	CLEANER WATER J	CLEANER, PIPE/SEWER, WATER JET, TRK MTD
5418	T	CLEANER SANDBLS	CLEANER, SANDBLASTING, PORTABLE
5421	Z	SPRAYER PESTICIDE	SPRAYER/DUSTER, PESTICIDE, PORTABLE, GED
5428	S	WASHER P/L INS	WASHER, POWERLINE INSULATOR, TRK/TRL MTD
5430	T	MARKER LINE TWD	MARKER, TRAFFIC LINE, ROAD, WHL MTD, TWD
5435	S	MARKER LINE S-P	MARKER, TRAFFIC LINE, ROAD, SELF-POWERED
5440	Z	POWER UNIT TRLR	POWER UNIT, TRAILER MOUNTED
5441	T	BURNER WEED TRLR	BURNER, WEED, GAS-FIRED, TRAILER MOUNTED
5455	Z	PURIFIER WATER	PURIFIER, WATER, SKID/TRUCK MTD
5498	Z	LAUNDRY TRL MTD	LAUNDRY, TRAILER MOUNTED
5500	Q	FSU AC TRLR MTD	FUEL SERV UNIT, A-C, TRLR MTD, 600-GPM AIR TRANSPORTABLE
5515	T	TONGS PIPE PWR	TONGS, PIPE, POWER OPER, WHL/SKID MTD
5525	Z	REEL HS FU PHIB	REEL, HOSE, FUELING, AMPHIBIOUS
5621	U	MOWER LAWN ROTY	MOWER, LAWN, ROTARY FLAT KNIFE, TOWED
5628	U	CUTTER STUMP	CUTTER, STUMP, WHEEL-MOUNTED, TOWED

NAVFAC Equip. Code	Alpha Code	NAVFAC Abbreviated Description	NAVFAC Expanded Long Description
5630	U	MOWER LAWN REEL	MOWER, LAWN, REEL, SELF-PROPEL, 30-IN/UP
5635	U	MULCH SEED FERT	MULCHER, SEED/FERTILIZ, SKD/TRK/TRLR MTD GED
5642	U	SHREDDER BRUSH	SHREDDER, BRUSH DISPOSER, GED, TRLR MTD
5643	U	SHRED SOIL PUL	SHREDDER, SOIL PULVERIZER/MIXER, TRLR MT
5650	U	MOWER TOWED	MOWER, HAMMERKNIFE OR SICKLEBAR, TOWED
5660	Z	PLATFORM HILIFT	PLATFORM, MAINT, HI-LIFT, S-P, TELE BOOM (NOT FOR SHIPBOARD USE)
5700	T	SWEeper ROTARY	SWEeper, ROTARY, S-P, WHSE/SIDEWALK/ROOF
5701	Q	SWEeper SHIPDK	SWEeper, SHIPDECK, IND, W/SCRUBBER, DED
5710	S	SWEeper MAGNET	SWEeper, STREET, MAGNETIC, S-P OR TOWED
5720	S	SWEeper ROTARY	SWEeper, ROTARY, STREET, PICKUP, S-P
5730	U	SWEeper LAWN SP	SWEeper, LAWN, SELF-PROPELLED OR TOWED
5740	T	SWEeper BROOM	SWEeper, STREET, REV BROOM, NONP-U, TWD
5745	Q	SWEeper SNOW	SWEeper, ROTA, TWD, SNOW, AIRBLAST, AFLD
5750	T	SNOWPLow ROTARY	SNOWPLow, S-C, ROTARY/ROTO-WING, TRK MTD SINGLE PURPOSE
5755	T	SNOWPLow DISPLC	SNOWPLow, S-C, DISPLACEMENT, TRK MTD (EXCEPT CODE 5757)
5757	T	SNOWPLow ROLOVR	SNOWPLow, ROLLOVER, W/WO SANDER, TRK MTD
5790	T	SANDER ST TRK	SANDER, SELF-CONTAINED, STREET, TRK MTD
5795	T	SANDER TRK MTG	SANDER, STREET, FOR TRK MOUNTING/TOWING
5797	Q	SCRUBBER SHIPDK	SCRUBBER, SHIPDECK, SELF-PROPELLED, DED TRUCK MOUNTED
5900	T	SHOP WOODWK TRL	SHOP, WOODWORKING, MOBILE, TRLR MTD
5910	T	SHOP MACH TRLR	SHOP, MACHINE, MOBILE, TRAILER MOUNTED
5912	T	SHOP TRADES TRLR	SHOP, TRADESMAN, MOBILE, TRAILER MOUNTED
5920	T	SHOP MACH TRK	SHOP, MACHINE, MOBILE, TRUCK MOUNTED
6222	T	TAMPER S-P RR	TAMPER, SELF-PROPELLED, RR, TIE/BALLAST EQUIPMENT, MAINTENANCE, RAILROAD, MISC
6600	Z	EQUIP MAINT RR	RR WHEEL MOUNTED (E.G., TIE PULLER, SPIKE HAMMER, ETC.)

P-1 LINE ITEM 09
FIREFIGHTING EQUIPMENT

0714	X	TRK W/DRY CHEM	TRUCK, CARGO, W/DRY CHEMICAL UNIT INSTL MODIFIED COMMERCIAL
7100	X	TRK FIRE/RESCUE	TRUCK, AIRCRAFT FIREFIGHTING/RESCU, MISC (SPECIFY COMPLETE DESCRIPTION FOR IDENTIFICATION)
7102	X	TRK FIRE/RESCUE	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE WITH MISCELLANEOUS RESCUE EQUIPMENT, AND SKID MTD EXTINGUISHING UNIT
7103	X	TRK FIRE HOSE	TRUCK, FIREFIGHTING, HOSE WAGON
7105	X	TRK FIRE TANK	TRUCK, FIREFIGHTING, TANK, FOAM/WATER
7155	X	TRK FIRE/RESCUE	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE, CO ₂ LOW PRES

NAVFAC Equip. Code	Alpha Code	NAVFAC Abbreviated Description	NAVFAC Expanded Long Description
7160	X	TRK FIRE/RESCUE	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE, 1000-GALLON
7165	X	TRK FIRE/CRASH	TRUCK, FIREFIGHT, CRASH, FOAM, SMALL MB-2
7175	X	TRK FIRE/RESCUE	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE, 400/500-GALLON
7180	X	TRK FIRE/RESCUE	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE, 1500-GALLON
7190	X	TRK FIRE/RESCUE	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE, 2300-GALLON
7195	X	TRK FIRE/RESCUE	TRUCK, AIRCRAFT FIREFIGHTING/RESCUE, 6000-GALLON
7200	X	TRLR FIRE PUMP	TRAILER, FIREFIGHTING, PUMP, 500-GPM
7225	X	AGENT RESUPPLY	AGENT RESUPPLIER, TRUCK/TRLR MTD
7230	X	FOAMER RESUPPLY	TRAILER, FOAMER/AGENT RESUPPLY/FIREFIGHT
7300	X	TRUCK FIRE MISC	TRUCK, FIREFIGHTING, MISC MOUNTED EQUIP PUMPS, TANKS, ETC. (SPECIFY TYPE)
7310	X	TRK FIRE 500GPM	TRUCK, FIREFIGHTING, PUMPER, 500-GPM
7320	X	TRK FIRE 750GPM	TRUCK, FIREFIGHTING, PUMPER, 750-GPM
7321	X	TRK FIRE 750GPM	TRUCK, FIREFIGHTING, STRUCTURAL, PUMPER, 750-1000 GPM
7330	X	TRK FIRE FOAM	TRUCK, FIREFIGHTING, FOAM GENERATING 1000-GALLON/UP
7340	X	TRK FIRE BRUSH	TRUCK, FIREFIGHTING, BRUSH/GRASS W/TANK
7341	X	TRK FIRE ATTACK	TRUCK, FIREFIGHTING, BRUSH/GRASS, ATTACK COMBINATION PUMPER, 4X4
7400	X	TRK FIRE LADDER	TRUCK, FIREFIGHTING, AERIAL LADDER
7500	X	TRLR GEN FOAM	TRAILER, GENERATOR, SELF-POWERED, FOAM
7501	X	PUMP FIRE PORT	PUMP, FIREFIGHTING, PORTABLE, 60-1000GPM

P-1 LINE ITEM 10
WEIGHT HANDLING EQUIPMENT

8160	Y	CRANE LCM WHL	CRANE, LANDING CRAFT, WHEEL MOUNTED (E.G., JEHEMMY OR GILHOIST)
8200	Y	CRANE TRK 5-14T	CRANE, TRK MTD, 2-ENG, PRT, 5-14 T CAPY
8205	Y	CRANE TRK 15-24	CRANE, TRK MTD, 2-ENG, PRT, 15-24 T CAPY
8210	Y	CRANE TRK 25-30	CRANE, TRK MTD, 2-ENG, PRT, 25-30 T CAPY
8215	Y	CRANE TRK 31-40	CRANE, TRK MTD, 2-ENG, PRT, 31-40 T CAPY
8218	Y	CRANE TRK 41-50	CRANE, TRK MTD, 2-ENG, PRT, 41-50 T CAPY
8219	Y	CRANE TRK 51-UP	CRANE, TRK MTD, 2-ENG, PRT, 51-T/UP CAPY
8220	Y	CRANE CRU 5-10T	CRANE, CRUISER, 1-ENG, PRT, 5-10 T CAPY
8230	Y	CRANE CRU 11-30	CRANE, CRUISER, 1-ENG, PRT, 11-30 T CAPY
8232	Y	CRANE CRU 31-40	CRANE, CRUISER, 1-ENG, PRT, 31-40 T CAPY
8233	Y	CRANE CRU 41-50	CRANE, CRUISER, 1-ENG, PRT, 41-50 T CAPY
8235	Y	CRANE CRU 60-80	CRANE, CRUISER, 1-ENG, PRT, 60-80 T CAPY
8240	Q	CRANE TRK CRASH	CRANE, TRUCK, CRASH, AIRCRAFT (E.G., STERLING MODEL DD150 OR EQUIVALENT)

NAVFAC Equip. Code	Alpha Code	NAVFAC Abbreviated Description	NAVFAC Expanded Long Description
8241	Q	CRAN CRSH AC SH	CRANE, CRASH, AC, NONREVOLV, S-P, SHIPBD
8242	Q	CRANE CRASH ITG	CRANE, CRASH, NONREVOLV, S-P, INTEGRAL (BUWEPS DESIGN)
8243	Q	CRANE CRASH HEL	CRANE, CRASH, HELICOPTER, WHL TRACTR MTD WITH DOZER ATTACHMENT FOR SHIPBOARD USE
8244	Q	CRAN CRASH AC SH	CRANE, CRASH, AC, W/TELE BOOM, SHBD, WHL TRACTOR MOUNTED, WITH FRONT PUSHER PLATE
8246	Y	CRANE HYD 20-30	CRANE, TRK MTD, HYD BOOM, 20-30 TON CAPY GED/DED
8249	Y	CRANE HYD 51-UP	CRANE, TRK MTD, HYD BOOM, 51-TON/UP
8250	Y	CRANE TORPEDO	CRANE, TORPEDO, PRT, TRUCK/TRAILER MTD
8252	Y	CRANE CARR TORP	CRANE, CARRIER, TORPEDO HANDLING, DED
8253	Y	CRANE WHL 15T/UP	CRANE, HYD, SWING CAB, WHL, 4X4, 15-T/UP
8254	Y	CRANE WHL 5-35T	CRANE, HYD BOOM, WHL MTD, 4X4, 5-35 TON
8260	Y	TRK MISSLE HNDL	TRUCK, MISSILE HANLING, PRT, MOBILE LIFT SPECIAL WEAPONS
8410	Y	CRANE LOC 15-30	CRANE, RAILROAD, LOCO, 15-30 TON CAPY
8420	Y	CRANE LOC 31-50	CRANE, RAILROAD, LOCO, 31-50 TON CAPY
8430	Y	CRAN LOC 51-200	CRANE, RR, LOCO WRECKING, 51-200 TON CAP
8800	Z	UNIT PROPELLING	UNIT, PROPELLING, MARINE, OUTBD, GED/DED

P-1 LINE ITEM 31
RAILWAY EQUIPMENT

6100	V	CAR RR MISC SER	CAR, RAILROAD, MISCELLANEOUS SERVICE
6110	V	CAR RR BOX	CAR, RAILROAD, BOX
6120	V	CAR RR FLAT STD	CAR, RAILROAD, FLAT, STANDARD
6130	V	CAR RR GONDOLA	CAR, RAILROAD, GONDOLA, SOLID BOTTOM
6140	V	CAR RR HOPPER	CAR, RAILROAD, HOPPER, SIDE/BOTTOM DUMP
6150	V	CAR RR DUMP	CAR, RAILROAD, DUMP, AIR/MANUALLY OPER
6160	V	CAR RR DEP CTR	CAR, RAILROAD, FLAT, DEPRESSED CENTER
6210	W	CAR RR M-O-W	CAR, RAILROAD, MOTOR, MAINTENANCE-OF-WAY
6220	W	CAR RR INSP/MNT	CAR, RAILROAD, INSPECTION/MAINTENANCE
6230	W	CAR RR MNT/GANG	CAR, RAILROAD, MOTOR, MAINT/SECTION GANG
6240	W	CAR SPOTTER R-R	CAR SPOTTER, ROAD-RAILER, PRT, SELF-PROP
6250	W	CAR RR AUTORAIL	CAR, RAILROAD, AUTORAILER
6310	V	HANDCAR RR	HANDCAR, RAILROAD
6320	V	PUSHCAR RR	PUSHCAR, RAILROAD
6340	V	CAR RR CABOOSE	CAR, RAILROAD, CABOOSE
6370	V	CAR RR COACH	CAR, RAILROAD, COACH
6400	V	CAR RR TANK GP	CAR, RAILROAD, TANK, GENERAL PURPOSE
6520	W	LOCO RR 21-39 T	LOCOMOTIVE, RAILROAD, 21-39 TON
6530	W	LOCO RR 40-59 T	LOCOMOTIVE, RAILROAD, 40-59 TON
6540	W	LOCO RR 60-80 T	LOCOMOTIVE, RAILROAD, 60-80 TON
6550	W	LOCO RR 81-100T	LOCOMOTIVE, RAILROAD, 81-100 TON
6560	W	LOCO RR 101T-UP	LOCOMOTIVE, RAILROAD, 101-TON/UP
6580	W	LOCO RR MINE	LOCOMOTIVE, RAILROAD, MINE

NAVFAC Equip. Alpha Code	NAVFAC Abbreviated Code	Description	NAVFAC Expanded Long Description
P-1 LINE ITEM 96			
SHIP'S WASTE AND OIL POLLUTION ABATEMENT EQUIPMENT			

8911	Z	OIL SKIMMER SM	OIL SKIM SYS, SMALL, PORT, 50GAL STORAGE FOR USE WITH EXTERNAL POWER SUPPLY
8912	Z	OIL SKIMMER MED	OIL SKIM SYS, MEDIUM, TRLR MTD, FLOAT HD
8916	Z	OIL SKIMMER LGE	OIL SKIM SYS, LARGE, FLOATING, SELF-PROP
8935	Z	OIL/WTR SEPRATR	OIL/WATER SEPARATOR SYS, RAFT SVC, 6000G STORAGE CAPACITY

			P-1 LINE ITEM 97	GVW
			SPECIAL PURPOSE EQUIPMENT	
0095	O	LAB MOBILE S-P	LAB, INERTIAL, MOBILE, SELF-PROPELLED (INTEGRAL BUS TYPE)	
0303	O	TRK 1/4-T ELEC	TRUCK, ELECTRONICS UNIT, 4X4	3,500
0310	O	TRK 1/2-T ELEC	TRUCK, ELECTRONICS UNIT, 4X2	4,800
0324	O	TRK 3/4-T ELEC	TRUCK, ELECTRONICS UNIT, 4X2	5,800
0340	O	TRK 1-T ELEC	TRUCK, ELECTRONICS UNIT	7,000
0409	O	TRK MINIVAN REC	TRUCK, MINIVAN, F/C,RECRUIT,GED,4X2	6,200
0410	O	TRK VAN RECRUIT	TRUCK, VAN, F/C,RECRUIT,CUST,GED,4X2	12,000
0430	O	TRK 1-1/2T ELEC	TRUCK, ELECTRONICS UNIT, 4X2	14,000
0520	O	TRK 2-1/2T ELEC	TRUCK, VAN, ELECTRONICS UNIT, 4X2	19,000
0540	O	TRK 2-1/2T BOMB	TRUCK, BOMB SERV, M-SERIES, 6X6 (M27 or M27B1)	19,000
0550	O	TRK 4-T ELEC	TRUCK, ELECTRONICS UNIT	22,000
0570	O	TRK 5-T AMPHIB	TRUCK, AMPHIBIAN, LARC-5, 4X4, 5-TON (REPLACEMENT FOR DUKW CODE 0531)	
0610	O	TRK 5-6 T ELEC	TRUCK, VAN, ELECTRONICS UNIT	24,000
0618	O	TRK 7T/UP ELEC	TRUCK, VAN, ELECTRONICS UNIT	34,000
0703	O	TRK 3-T WP/SERV	TRUCK, GUIDED MISSILE/WEAPONS SERVICING WITH SERVICING PLATFORM (MO/1)	21,000
0705	Q	TRK AF CON TOWR	TRUCK, AIRFIELD CONTROL TOWER, MOBILE	
0706	Q	TRK TRANS PILOT	TRUCK, TRANSPORTER, PILOTS W/PRESS SUITS	
0720	O	TRUCK MISCEL	TRUCK, MISC, EXHIBIT/TRAINING/RECRUITING/DISPLAY/GENERAL SERVICES/UTILITY, ETC.	
0721	O	TRK VAN CAL/SER	TRUCK, VAN, TEST FAC/CALIBRATION SERVICE (GAS TURBINE ENGINE TEST FACILITIES)	
0736	O	TRK TARGET RETR	TRUCK, TARGET RETRIEVING	
0760	O	TRK HYD PEROXID	TRUCK, TANK, HYDROGEN PEROXIDE	
0761	O	TRK PURE WATER	TRUCK, TANK, PURE WATER, NUCLEAR	
0806	P	TRAILER HELIUM	TRAILER, HELIUM	
0807	P	TRLR CHASS BOAT	TRAILER, CHASSIS, BOAT	
0846	P	TRLR TANK LOX	TRAILER, TANK, LIQUID OXYGEN, 150-500GAL	
0847	Q	SEMI DRES/BRIEF	SEMITRLR, VAN, DRESSING/BRIEFING/ALERT FOR AIR CREWS WEARING FULL PRESSURE SUITS	

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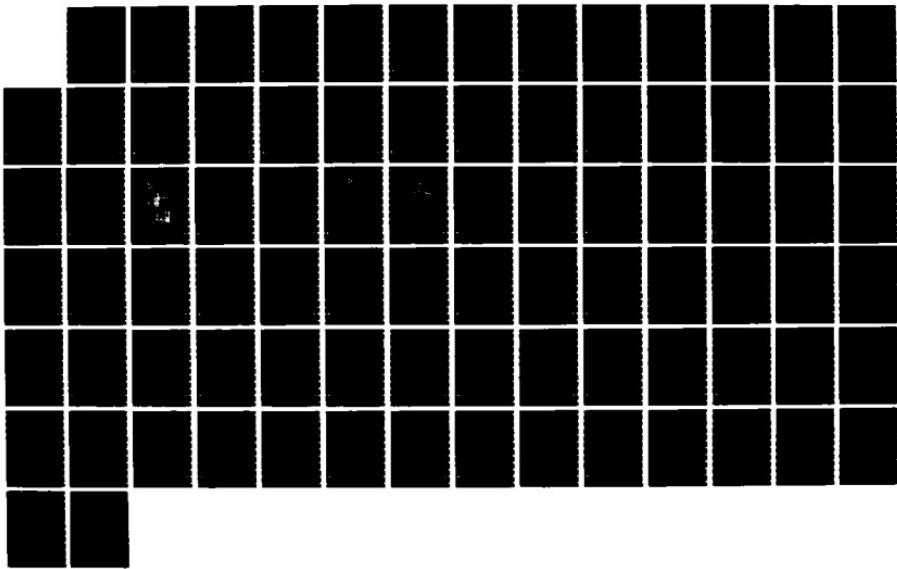
MANAGEMENT OF TRANSPORTATION EQUIPMENT(U) NAVAL
FACILITIES ENGINEERING COMMAND ALEXANDRIA VA NOV 82
NAVFAC-P-300

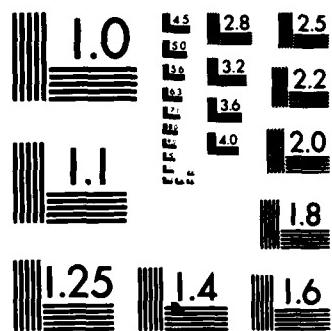
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

NAVFAC Equip. Alpha Code	NAVFAC Abbreviated Code	Description	NAVFAC Expanded Long Description
0849	Q	TRLR OPER FLITE	TRAILER, OPERATIONAL FLIGHT TRAINER
0851	P	TRLR HOUS/LAB/O	TRAILER, HOUSE/LABORATORY/OFFICE/PHOTO-GRAPHIC/RESEARCH/DISASTER CONTROL
0860	P	TRLR AIR CONDIT	TRAILER, AIR CONDITIONER
0865	Q	TRAILER WING	TRAILER, WING
0868	P	TRLR TARG RETRV	TRAILER, TARGET RETRIEVING
0871	P	TRLR 1/2-T ELEC	TRAILER, CHASSIS, ELECTRONICS, 1/2-TON
0872	P	TRLR 3/4-T ELEC	TRAILER, CHASSIS, ELECTRONICS, 3/4-TON
0873	P	TRLR 1-3 T ELEC	TRAILER, CHASSIS, ELECTRONICS, 1-3 TON
0874	P	TRLR 4-7 T ELEC	TRAILER, CHASSIS, ELECTRONICS, 4-7 TON
0875	P	TRLR 8-13T ELEC	TRAILER, CHASSIS, ELECTRONICS, 8-13 TON
0876	P	TRLR 14T/UP ELC	TRAILER, CHASSIS, ELECTRONICS, 14-TON UP
0878	P	TRLR INSTRUMENT	TRAILER, CHASSIS, ELECT, INSTRMT/DIRECTR
0879	P	TRAILER ANTENNA	TRAILER, ELECTRONICS, ANTENNA
0885	P	TRLR PURE WATER	TRAILER, TANK, PURE WATER, NUCLEAR
0893	Q	SEMI MISS TRANS	SEMITRAILER, GUIDED MISSILE TRANSPORT
0896	Q	TRLR MISS HNDLG	TRAILER, MSL HNDLG, LAUNCH/ERECT/TRANSPT
0897	P	TRLR LOX VAPOR	TRAILER, LIQUID OXYGEN VAPORIZING SYSTEM
0899	P	TRLR LIQ NITROG	TRAILER, TANK, LIQUID NITROGEN
0908	Z	GOLF CART S/S	GOLF CART (SPECIAL SERVICES ONLY)
3175	Z	COMPRESSOR HEL	COMPRESSOR, HELIUM, PORTABLE, SKID/TRLR
5135	Z	GENERATOR ELEC	GENERATOR, PORTABLE, ELECTRONIC, 400-HZ SKID/TRUCK/TRAILER (ALL SIZES)
5415	Z	CLEANER STM BOM	CLEANER, BOMB, STEAM, TRLR MTD
8700	Z	WINCH DRUM PWR	WINCH, DRUM, POWER OPERATED, GED/DED

P-1 LINE ITEM 98

**ABC WARFARE DISASTER PREPAREDNESS
DECONTAMINATION EQUIPMENT**

5420	Z	SPRAYER DECONTM	SPRAYER, DECONTAM, GED, TRK/SKD/TRL MTD
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P-1 LINE ITEM 99

MOBILE UTILITY SUPPORT EQUIPMENT (MUSE)

2732	Z	BOILER ST 300HP	BOILER, STEAM, PORTABLE, 300-HP/UP
5125	Z	GEN 101-150 KW	GENERATOR, PORTABLE, GED/DED, 101-150 KW SKID/TRUCK/TRAILER (EXCEPT ELECTRONICS GENERATORS)
5126	Z	GEN 251-499 KW	GENERATOR, PORTABLE, GED/DED, 251-499 KW SKID MOUNTED (EXCEPT ELECTRONICS GENERATORS)
5127	Z	GEN 500-750 KW	GENERATOR, PORTABLE, GTE/DED, 500-750 KW SKID/TRUCK/TRAILER (EXCEPT ELECTRONICS GENERATORS)

NAVFAC Equip. Alpha Code	NAVFAC Abbreviated Code	NAVFAC Description	NAVFAC Expanded Long Description
5128	Z	GEN 151-250 KW	GENERATOR, PORTABLE, GED/DED, 151-250 KW SKID/TRUCK/TRAILER (EXCEPT ELECTRONICS GENERATORS)
5130	Z	GEN 751-KW & UP	GENERATOR, PORTABLE, GTE/DED, 751-KW/UP SKID/TRAILER (EXCEPT ELECTRONICS GENERATORS)
5150	Z	SUBSTA MOBILE	SUBSTATION, MOBILE, W/TRANSF & FEED SECT
5155	Z	TRNSFORMER MOBL	TRANSFORMER, MOBILE, 750-KVA/UP
5157	Z	DIST SYSTEM PWR	DISTRIBUTION SYSTEM, POWER, TRAILER MTD
5450	Z	DISTILLER MOBIL	DISTILLER, WATER, SKID MTD, GED/DED/EMD
5530	Z	AIR CONDIT MOBL	AIR CONDITIONER, MOBL, SKID, GED/DED/EMD
6700	Z	CAR RR BAT CHG	CAR, RAILROAD, BATTERY CHARGING, GED/DED

**APPENDIX H. TRANSPORTATION MAINTENANCE AND OPERATIONS
UNIT COST STANDARDS FOR ADMINISTRATIVE USE MOTOR VEHICLES,
CONSTRUCTION, AND ALLIED EQUIPMENT**

1. Scope. These guidelines provide a uniform system for the preparation of a planned transportation maintenance budget. The budget should become an operational plan with scheduled periodic performance evaluation. The revised input standards contained in Table H-1 provide for all the direct man-hours of labor required for transportation maintenance expenses. All material, except for fuel, will be charged as maintenance expenses in accordance with Vol. 3, Chapter 7, of NAVCOMPT Manual.

2. Budget Preparation. A realistic transportation maintenance budget should be developed by using the following five information elements: (1) vehicle/equipment requirements and usage in terms of units, miles driven, or hours operated; (2) man-hour input standards; (3) shop labor rate; (4) standard material cost per hour of labor; and (5) overhead labor. To adequately account for all maintenance man-hours, it is necessary to include equipment in Alpha Code "Z." Since man-hour inputs are not provided for "Z" equipment, these man-hours should be collected from historical data, or from NAVCOMPT Form 2168 under Cost Account Number (CAN) 6440. In order to ensure adequate staffing man-hours for work performed on other activity equipment, CAN 6460 should also be included. However, as this is a reimbursable CAN, a deduction should be made on the NAVCOMPT 2168 budget submission. Activity Transportation Division Directors should follow claimants' budget guidance instructions for details of budget preparations. Figure H-1 is a sample worksheet which should be used in preparation of the transportation maintenance budget plan.

a. Equipment Requirements and Usage. The accuracy of the budget will depend to a large degree upon how well the vehicle/equipment requirements and usage can be projected. Analysis of the automotive and construction equipment historical utilization data in each Equipment Cost Code (ECC) should provide sufficient information to project equipment requirements and usage for the budget period. It is recognized that variables such as mission change and funding levels must be considered.

b. Man-Hour Input Standards. The man-hour input standards contained in Table H-1 provide for all direct maintenance labor for normal transportation, including running expenses. These input standards cover the direct labor necessary to maintain a unit in a safe and reliable condition throughout its economic service life. These standards include the necessary labor hours to lubricate, service, clean and wash, install tires and batteries, as well as remove, replace, and repair major and minor components, sub-assemblies, parts, and accessories to correct or prevent malfunctions or deterioration except those resulting from accidents. The standards do not cover extensive one time major overhaul and rebuild of the complete unit of equipment.

c. Computation of Man-Hour Input from Standards. The recommended procedure for determining direct maintenance man-hour input for budget projection (plan) is to list inventory quantities by ECC sequence summarized by cost account number (CAN). Using Table H-1 of this Appendix, select the established man-hour input standard for each specific ECC in inventory. List unit target miles, hours, and leave column blank for those ECC with annual man-hour

TABLE H-1
TRANSPORTATION MAINTENANCE MAN-HOUR
INPUT STANDARDS

NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours			NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours				
		Man-hours	Per				Man-hours	Per			
			1,000 Miles	Hour				1,000 Miles	Hour		
0060	B	7.00	X		0302	O	35		X		
0061	B	7.00	X		0303	O	35		X		
0062	B	7.00	X		0305	H	3.50	X			
0063	B	7.00	X		0306	F	5.90	X			
0065	C	11.20	X		0307	O	35		X		
0066	C	11.20	X		0308	H	3.50				
0067	C	11.20	X		0310	O	28		X		
0070	D	11.20	X		0311	H	3.50	X			
0071	D	11.20	X		0312	H	3.50	X			
0090	P	45		X	0313	G	2.80	X			
0095	O	42		X	0314	F	5.90	X			
0098	O	42		X	0315	H	3.50	X			
0099	O	42		X	0316	G	2.80	X			
0102	A	2.40	X		0317	H	3.50	X			
0103	A	2.40	X		0318	H	3.50	X			
0104	A	2.40	X		0319	G	2.80	X			
0105	A	2.40	X		0320	O	29		X		
0114	A	2.40	X		0322	H	3.50	X			
0200	E	2.40	X		0324	O	35		X		
0202	E	2.40	X		0325	O	35		X		
0205	F	5.90	X		0326	H	3.50	X			
0210	E	2.40	X		0327	H	3.50	X			
0220	F	2.40	X		0328	H	3.50	X			
0297	F	5.90	X		0329	H	3.50	X			
0299	F	5.90	X		0330	H	3.50	X			

TABLE H-1
TRANSPORTATION MAINTENANCE MAN-HOUR
INPUT STANDARDS (Cont.)

NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours			NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours				
		Man-hours	Per				Man-hours	Per			
			1,000 Miles	Hour				1,000 Miles	Hour		
0331	F	5.90	X		0423	J	4.80	X			
0332	F	5.90	X		0424	J	4.80	X			
0333	F	5.90	X		0426	J	4.80	X			
0334	O	28		X	0428	J	4.80	X			
0335	H	3.50	X		0430	O	48		X		
0336	O	63		X	0438	O	45		X		
0340	O	55		X	0439	O	50		X		
0341	I	4.40	X		0441	J	4.80	X			
0342	I	4.40	X		0443	J	4.80	X			
0343	I	4.40	X		0445	J	4.80	X			
0344	I	4.40	X		0446	J	4.80	X			
0345	I	4.40	X		0449	J	4.80	X			
0346	O	63		X	0450	O	58		X		
0348	I	4.40	X		0455	J	4.80	X			
0349	I	4.40	X		0456	J	4.80	X			
0350	I	4.40	X		0457	J	4.80	X			
0352	O	45		X	0520	O	62		X		
0355	I	4.40	X		0521	K	7.00	X			
0360	O	58		X	0523	K	7.00	X			
0361	F	5.90	X		0525	K	7.00	X			
0362	I	4.80	X		0526	K	7.00	X			
0409	O	48		X	0527	K	7.00	X			
0410	O	48		X	0530	K	7.00	X			
0420	J	4.80	X		0532	O	70		X		
0421	J	4.80	X		0533	O	70		X		

TABLE H-1
TRANSPORTATION MAINTENANCE MAN-HOUR
INPUT STANDARDS (Cont.)

NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours			NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours				
		Man-hours	Per				Man-hours	Per			
			1,000 Miles	Hour				1,000 Miles	Hour		
0534	O	70		X	0613	M	9.20	X			
0535	O	70		X	0614	M	9.20	X			
0536	O	70		X	0615	O	92		X		
0537	O	70		X	0616	O	92		X		
0539	O	70		X	0617	M	9.20	X			
0540	O	70		X	0618	O	92		X		
0545	L	8.90	X		0620	M	9.20	X			
0550	O	91		X	0623	M	9.20	X			
0570	O	246		X	0624	M	9.20	X			
0580	M	9.20	X		0625	M	9.20	X			
0582	M	9.20	X		0630	M	9.20	X			
0583	M	9.20	X		0631	M	9.20	X			
0587	O	92		X	0632	M	9.20	X			
0588	O	92		X	0633	M	9.20	X			
0590	O	191		X	0636	M	9.20	X			
0591	O	96		X	0638	N	11.20	X			
0601	M	9.20	X		0643	N	11.20	X			
0602	M	9.20	X		0644	N	11.20	X			
0603	M	9.20	X	.	0645	N	11.20	X			
0604	M	9.20	X		0649	N	11.20	X			
0605	M	9.20	X		0701	O	260		X		
0606	M	9.20	X		0703	O	169		X		
0607	O	92		X	0704	O	42		X		
0609	M	9.20	X		0705	Q	.019	X			
0610	O	92		X	0706	Q	.023	X			

TABLE H-1
TRANSPORTATION MAINTENANCE MAN-HOUR
INPUT STANDARDS (Cont.)

NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours				NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours					
		Man-hours	Per					Man-hours	Per				
			1,000 Miles	Hour	Unit (annual)				1,000 Miles	Hour	Unit (annual)		
0707	Q	.027		X		0740	O	42			X		
0708	O	35		X		0742	O	34			X		
0709	O	239		X		0743	Q	.017		X			
0710	O	251		X		0744	Q	.023		X			
0711	O	36		X		0746	O	48			X		
0713	O	70		X		0750	Q	.034		X			
0714	X	.034		X		0751	O	70			X		
0715	O	70		X		0752	Q	.044		X			
0717	O	98		X		0753	O	92			X		
0719	O	25		X		0754	O	92			X		
0720	O	25		X		0756	Q	.044		X			
0721	O	28		X		0757	O	48			X		
0722	O	28		X		0758	O	70			X		
0723	O	204		X		0759	O	92			X		
0724	O	127		X		0760	O	35			X		
0725	O	127		X		0761	O	35			X		
0730	O	39		X		0800	P	3					
0731	Q	.019		X		0801	P	3			X		
0732	O	45		X		0802	P	3			X		
0733	O	127		X		0803	P	7			X		
0734	O	34		X		0804	P	3			X		
0735	O	48		X		0805	P	4			X		
0736	O	39		X		0806	P	6			X		
0738	O	28		X		0807	P	4			X		
0739	O	34		X		0808	P	3			X		

TABLE H-1
TRANSPORTATION MAINTENANCE MAN-HOUR
INPUT STANDARDS (Cont.)

NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours			NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours				
		Man-hours	Per				Man-hours	Per			
			1,000 Miles	Hour				1,000 Miles	Hour		
0809	P	20		X	0835	P	17		X		
0810	P	17		X	0839	P	22		X		
0811	P	20		X	0840	P	25		X		
0812	P	17		X	0841	P	11		X		
0813	P	20		X	0842	P	11		X		
0814	P	15		X	0843	P	6		X		
0815	P	17		X	0844	P	11		X		
0816	P	17		X	0845	P	3		X		
0817	P	20		X	0846	P	4		X		
0818	P	15		X	0847	Q	.817		X		
0819	P	28		X	0848	T	34		X		
0820	P	34		X	0849	Q	.002		X		
0821	P	17		X	0851	P	8		X		
0822	P	20		X	0852	P	3		X		
0823	P	22		X	0853	P	11		X		
0824	P	24		X	0855	P	11		X		
0825	P	28		X	0856	P	11		X		
0826	P	32		X	0857	P	8		X		
0827	P	34		X	0858	P	5		X		
0828	P	48		X	0859	P	17		X		
0829	P	4		X	0860	P	11		X		
0830	P	11		X	0862	P	11		X		
0831	P	11		X	0864	P	11		X		
0833	P	7		X	0865	Q	.003		X		
0834	P	8		X	0868	P	11		X		

TABLE H-1
TRANSPORTATION MAINTENANCE MAN-HOUR
INPUT STANDARDS (Cont.)

NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours				NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours					
		Man-hours	Per					Man-hours	Per				
			1,000 Miles	Hour	Unit (annual)				1,000 Miles	Hour	Unit (annual)		
0871	P	6			X	1100	R	.057		X			
0872	P	3			X	1110	R	.062		X			
0873	P	7			X	1120	R	.041		X			
0874	P	4			X	1200	R	.090		X			
0875	P	7			X	1210	R	.123		X			
0876	P	5			X	1220	R	.045		X			
0878	P	17			X	1230	R	.077		X			
0879	P	11			X	1240	R	.057		X			
0880	P	4			X	1300	R	.099		X			
0881	P	5			X	1310	R	.150		X			
0882	P	8			X	1320	R	.098		X			
0883	P	4			X	1330	R	.150		X			
0884	P	8			X	1340	R	.160		X			
0885	P	31			X	1350	R	.123		X			
0886	P	11			X	1360	R	.050		X			
0887	Q	.008		X		1370	R	.055		X			
0888	P	14			X	1380	R	.056		X			
0890	P	31			X	1390	R	.043		X			
0891	Q	.027		X		1400	R	.070		X			
0892	P	34			X	1410	R	.029		X			
0893	Q	.005		X		1420	R	.038		X			
0896	Q	.005		X		1430	R	.099					
0897	P	11			X	1500	R	.138		X			
0898	P	17			X	1600	R	.024		X			
0899	P	3			X	1610	R	.028		X			

TABLE H-1
TRANSPORTATION MAINTENANCE MAN-HOUR
INPUT STANDARDS (Cont.)

NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours			NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours				
		Man-hours	Per				Man-hours	Per			
			1,000 Miles	Hour				1,000 Miles	Hour		
1800	R	.081	X		2425	T	600		X		
1810	R	.210	X		2430	S	.005		X		
1820	R	.106	X		2431	S	.018		X		
1830	R	.210	X		2432	S	.024		X		
1840	R	.122	X		2433	S	.027		X		
1850	R	.231	X		2434	S	.043				
1860	R	.231	X		2462	T	244		X		
1870	R	.276	X		2470	S	.043		X		
1900	R	.070	X		2520	S	.146		X		
2110	T	158		X	2521	S	.113		X		
2111	T	27		X	2522	T	8		X		
2120	T	70		X	2530	T	5		X		
2130	T	12		X	2535	S	.207		X		
2200	T	383		X	2540	T	5		X		
2210	T	98		X	2542	T	164		X		
2220	T	10		X	2610	T	28		X		
2225	T	5		X	2615	T	52		X		
2300	S	.325	X		2620	T	164		X		
2325	T	3		X	2625	T	125		X		
2340	T	12		X	2720	T	118		X		
2410	T	168		X	2730	T	28		X		
2415	T	88		X	2735	T	17		X		
2416	T	150		X	2740	T	17		X		
2417	T	88		X	2745	T	109		X		
2420	S	.028	X		2750	T	14		X		

TABLE H-1
TRANSPORTATION MAINTENANCE MAN-HOUR
INPUT STANDARDS (Cont.)

NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours				NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours					
		Man-hours	Per					Man-hours	Per				
			1,000 Miles	Hour	Unit (annual)				1,000 Miles	Hour	Unit (annual)		
2760	T	.56			X	4330	S	.400		X			
2840	T	.11			X	4340	S	.500		X			
3100	S	.041		X		4410	T	8			X		
3110	S	.043		X		4420	S	.244		X			
3111	S	.064		X		4530	S	.228		X			
3130	S	.108		X		4531	S	.182		X			
3135	S	.108		X		4540	S	.040		X			
3150	S	.108		X		4610	T	10			X		
3155	S	.108		X		4615	S	.193		X			
3160	S	.210		X		4620	T	8			X		
3165	S	.210		X		4621	T	8			X		
3530	T	.34			X	4622	S	.316		X			
3531	S	.195		X		4625	T	13			X		
3532	S	.195		X		4630	S	.112			X		
3630	T	123			X	4635	S	.140		X			
3710	S	.079		X		4640	S	.169			X		
3720	S	.281		X		4710	T	15			X		
4230	S	.210		X		4730	T	25			X		
4240	S	.491		X		4731	T	34			X		
4250	S	.540		X		4750	S	.363			X		
4260	S	.644		X		4760	S	.259			X		
4270	S	.701		X		4770	T	132			X		
4305	T	7			X	4805	S	.260		X			
4310	S	.175		X		4809	S	.059		X			
4320	T	7			X	4810	S	.077		X			

TABLE H-1
TRANSPORTATION MAINTENANCE MAN-HOUR
INPUT STANDARDS (Cont.)

NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours			NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours				
		Man-hours	Per				Man-hours	Per			
			1,000 Miles	Hour				1,000 Miles	Hour		
4820	S	.126		X		S	.069		X		
4830	S	.210		X		S	.148		X		
4840	S	.280		X		T	13		X		
4850	S	.417		X		T	15		X		
4851	S	.422		X		T	22		X		
4860	S	.092		X		T	21		X		
4865	S	.231		X		S	.130		X		
4872	U	.092		X		Q	.217		X		
4873	U	.101		X		S	.223		X		
4874	U	.111		X		T	5		X		
4875	U	.113		X		S	.043		X		
4876	U	.127		X		T	8		X		
4877	U	.250		X		S	.175		X		
4878	Q	.092		X		S	.153		X		
4891	S	.168		X		T	10		X		
4892	S	.231		X		S	.269		X		
4893	S	.441		X		T	6		X		
4894	Q	.472		X		S	.140		X		
5110	T	17		X		T	7		X		
5113	Q	.062		X		Q	.069		X		
5120	T	21		X		T	17		X		
5121	T	24		X		U	.135		X		
5122	T	33		X		U	.135		X		
5123	I	35		X		U	.201		X		
5124	T	53		X		U	.077		X		

TABLE H-1
TRANSPORTATION MAINTENANCE MAN-HOUR
INPUT STANDARDS (Cont.)

NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours			NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours				
		Man-hours	Per				Man-hours	Per			
			1,000 Miles	Hour				1,000 Miles	Hour		
5642	U	.186		X	5912	T	5		X		
5643	U	.008		X	5920	T	95		X		
5650	U	.016		X	6100	V	11		X		
5700	T	42		X	6110	V	15		X		
5701	Q	.020		X	6120	V	9		X		
5710	S	.056		X	6130	V	19		X		
5720	S	.288		X	6140	V	19		X		
5730	U	.022		X	6150	V	25		X		
5740	T	25		X	6160	V	14		X		
5745	Q	125		X	6210	W	.029		X		
5750	T	214		X	6220	W	.020		X		
5755	T	182		X	6222	T	70		X		
5757	T	272		X	6230	W	.034		X		
5790	T	112		X	6240	W	.063		X		
5795	T	17		X	6250	W	.038		X		
5797	Q	.119		X	6310	V	4		X		
5820	S	.179		X	6320	V	6		X		
5830	S	.238		X	6340	V	20		X		
5831	S	.252		X	6370	V	.56		X		
5833	S	.209		X	6400	V	10		X		
5835	S	.228		X	6520	W	.125		X		
5840	T	74		X	6530	W	.185		X		
5842	T	77		X	6540	W	.281		X		
5900	T	5		X	6550	W	.561		X		
5910	T	5		X	6560	W	.701		X		

TABLE H-1
TRANSPORTATION MAINTENANCE MAN-HOUR
INPUT STANDARDS (Cont.)

NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours			NAVFAC Equip. Cost Code	Alpha Code	Maintenance man-hour input Standard hours				
		Man-hours	Per				Man-hours	Per			
			1,000 Miles	Hour				1,000 Miles	Hour		
6580	W	.042		X		8205	Y	.351	X		
7100	X	.094		X		8210	Y	.421	X		
7102	X	.084		X		8215	Y	.505	X		
7103	X	.070		X		8218	Y	.808	X		
7105	X	.056		X		8219	Y	.948	X		
7155	X	.280		X		8220	Y	.266	X		
7160	X	.445		X		8230	Y	.293	X		
7175	X	.385		X		8232	Y	.497	X		
7180	X	.609		X		8233	Y	.672	X		
7190	X	.609		X		8235	Y	.790	X		
7195	X	.609		X		8240	Q	.448	X		
7200	X	.069		X		8241	Q	.983	X		
7225	X	.595		X		8242	Q	.878	X		
7230	X	.016		X		8243	Q	.570	X		
7300	X	.098		X		8244	Q	.570	X		
7310	X	.084		X		8246	Y	.386	X		
7320	X	.105		X		8249	Y	.771	X		
7321	X	.210		X		8250	Y	.448	X		
7330	X	.210		X		8252	Y	.245	X		
7340	X	.112		X		8253	Y	.203	X		
7341	X	.126		X		8254	Y	.161	X		
7400	X	.210		X		8260	Y	.438	X		
7500	X	.057		X		8410	Y	.392	X		
8160	Y	.336		X		8420	Y	.448	X		
8200	Y	.351		X		8430	Y	.525	X		

WORKSHEET FOR MAINTENANCE DIRECT LABOR AND MATERIAL BUDGET PART A									
Column 1	2	3	4	5	6	7	8	9	10
Equip. Code	Inventory	Estimated Miles/Hours	Maint. man-hour input standards	Annual budget man-hours	Shop labor rate	Labor dollar	Material cost factor	Material cost	Total Labor & Material
0104	40	996,000	2.40/1000 miles	2,390	\$7.52	\$17,973	\$5.11	\$12,213	\$30,186
4875	6	5,200	.118/hour	614	7.52	4,617	5.11	3,138	7,755
5630	19	—	42/unit	798	7.52	6,001	5.11	4,077	10,078

WORKSHEET FOR MAINTENANCE INDIRECT LABOR AND MATERIAL BUDGET PART B									
Column	1	2	3	4	5	6	7	8	
Cost account	Function	Man-years	Man-hours	Labor rate	Labor cost	Material cost			Total labor & material
6910	Supervision	3	5160	\$9.30	\$47,988				\$47,988
6910	Inspectors	3	5160	8.27	42,673				42,673
6910	Repairs shop tools	—	510	7.52	3,835				5,635
6910	Motor oil, lub & fluid	—	—	—	—				4,600

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Figure H-1
Sample Worksheet for Maintenance
Direct Labor and Material Budget

input standard. There will be three separate computations/formulas for determining the annual budgeted man-hour inputs, depending upon whether the equipment standard man-hour input is by mile, hour, or on annual unit basis. Examples of computations are: (1) mileage, (2) hours, and (3) annual unit, as follows.

Table H-1

(1) MAN-HOUR INPUT (STANDARD) PER 1,000 MILES OPERATED

<u>Alpha</u>	<u>ECC</u>	<u>Inventory</u>	<u>Unit target mile/hr</u>	<u>Man-hour input std.</u>	<u>Annual budget man-hours</u>
A	0104	20	12,000 Miles	2.40 per 1,000 mi	576
<u>Formula</u> $\frac{12,000 \times 20 \times 2.40}{1,000} = 576$					

(2) MAN-HOUR INPUT (STANDARD) PER HOUR OPERATED

<u>ECC</u>	<u>Inventory</u>	<u>Unit target mile/hr</u>	<u>Man-hour input std.</u>	<u>Annual budget man-hours</u>
4851	2	1,050 Hours	.422 per hr	886
<u>Formula</u> $1,050 \times 2 \times .422 = 886$				

(3) MAN-HOUR INPUT (STANDARD) PER UNIT/YEAR

<u>ECC</u>	<u>Inventory</u>	<u>Unit target</u>	<u>Man-hour input std.</u>	<u>Annual budget man-hours</u>
4710	6	1 year	15 per unit/year	90
<u>Formula</u> $6 \times 15 = 90$				

d. Shop Labor Rate. The shop labor rate used in budget preparation should include acceleration for leave and other fringe benefits and a projected cost of living increase. (This information should be provided by the local comptroller.) The shop labor rate can be developed by dividing the labor cost/dollars by the direct labor hours for the maintenance branch using the most recent quarterly labor and material cost report plus projected acceleration factor.

Example:

(a) Total direct labor cost for the Maintenance Branch = \$96,000.00 18,000 man-hours direct labor = \$5.33 average labor rate + 33 percent fringe benefits + 8 percent cost of living increase = \$7.52 shop labor rate.

e. Material Cost Factor Per Hour of Labor. A material cost factor for each hour of direct labor shall be developed locally, using cost data from latest annual Transportation Cost Report (TCR). To determine the material cost factor for each hour of direct labor, divide the annual reported total material cost for the maintenance branch by the reported direct labor hours. The material cost factor should be escalated to allow for price increases anticipated in the budget year.

Example: Total direct material for the maintenance branch = \$64,500.00
13,500 man-hours of direct labor = 4.78×1.07 (7 percent cost escalation) =
\$5.11 per labor hour, activity developed material factor.

f. Maintenance Overhead. The total overhead hours under Cost Code 6900 should not exceed 43 percent of the direct productive standard hours for the maintenance branch. Considering normal staffing, overhead labor is based on a ratio of 3 overhead personnel to 10 direct personnel with direct labor personnel effective for 91 percent of available 1,728 annual direct labor hours.

Formula:

- a. $3 \times 1,728 = 5,184$ indirect/overhead available labor hours
- b. $10 \times 1,728 = 17,280$ direct labor hours
- c. $17,280 \times .91 = 15,724$ effective direct labor hours
- d. $17,280 - 15,724 = 1,556$ indirect/overhead for production labor
- e. $5,184 + 1,556 = 6,740$ total indirect/overhead hours
- f. $\frac{6,740}{15,724} \times 100 = 43$ percent indirect to direct hours

g. Budget Computation. (Direct Labor and Material) Sample worksheets for direct labor and material budgets are shown in Figure H-1 Part A. Following are the appropriate column entries:

COLUMN (1) EQUIP. CODE. List NAVFAC Equipment Cost Code ECC.

COLUMN (2) INVENTORY. Enter inventory on hand.

COLUMN (3) ESTIMATED MILES/HOURS. Enter estimated miles or hours to be operated in budget year.

COLUMN (4) MAINT. MAN-HOUR INPUT STANDARDS. Enter maintenance man-hour input standard from Table H-1 for ECC.

COLUMN (5) ANNUAL BUDGET MAN-HOURS. Compute total annual maintenance man-hour by multiplying Column (3) by Column (4).

COLUMN (6) SHOP LABOR RATE. Enter the shop labor rate. To compute the shop labor rate follow instructions contained in paragraph 2.d.

COLUMN (7) LABOR DOLLAR. Enter the total labor dollar for each equipment code entry. This entry is obtained by multiplying Column (5) by Column (6).

COLUMN (8) MATERIAL COST FACTOR. Enter activity developed material cost factor. To obtain this entry follow procedures outlined in paragraph 1.e.

COLUMN (9) MATERIAL COST. Enter the total material cost for each equipment code entry. This entry is obtained by multiplying Column (5) by Column (8).

COLUMN (10) TOTAL LABOR AND MATERIAL. Enter the total labor and material cost for each equipment code entry. To obtain add Column (7) and Column (9).

h. Budget Computation. (Indirect Labor and Material) Sample worksheet for indirect labor and material budget is shown in Figure H-1 Part B. Following are the appropriate column entries:

COLUMN (1) COST ACCOUNT. Enter the appropriate cost code for each function. The cost codes are listed by categories in Volume 3 Chapter 7 paragraph 037121 and 037122 of the NAVCOMPT Manual.

COLUMN (2) FUNCTION. Enter the position title for each indirect function required.

COLUMN (3) MAN-YEARS. Enter the total man-years required for each indirect function listed.

COLUMN (4) MAN-HOURS. Enter the total man-hours for each indirect function. Compute on the basis of 1,728 for each full time indirect employee and add hours required for direct personnel performing indirect/overhead functions.

COLUMN (5) LABOR RATE. Enter labor rate for each entry. To obtain take the average base pay for each title listed, add fringe benefits and projected cost of living increase.

COLUMN (6) LABOR COST. Enter total labor dollars for each entry. This entry is obtained by multiplying Column (4) by Column (5).

COLUMN (7) MATERIAL COST. Enter the estimated cost of material for each indirect entry.

i. Budget Control. A sound management system requires allocation of a cost effective level of funding in a budget plan that will require efficient management to execute within this level of funding. Effective budget control depends on management receiving timely feedback information that will enable the manager to isolate his problem areas, make proper decisions, and to initiate the necessary corrective action. Such information must relate performance against the resources plan (budget) and established standards. The Navy Resources Management System (RMS) as set forth in NAVSO P3006-1, Financial Management of Resources, provides these reports on a monthly basis as an output from the activity financial management reporting system. These reports are as follows.

(1) Performance Statement (NAVCOMPT 2169). This report is the transportation manager's major tool for control. The report provides data of actual performance against the budget plan. The report provides actual expenditures against the budget plan, and the percent expended to date. It also provides work units achieved to date against the planned work units, and the

percent achieved to date. Finally it provides actual unit costs against standard or budgeted unit costs. These data are provided against each line item in the budget. The transportation manager can immediately detect deviations from the budget plan and make the necessary analysis to determine the cause and effect of the deviation. This may require further data breakout of specific elements of expenditure that are out of line. This detail is found in the NAVCOMPT 2168 Operating Budget/Expense described in the following paragraph.

(2) Operating Budget/Expense Report (NAVCOMPT 2168). This report provides a detail breakout of cumulative expenditures shown on the NAVCOMPT 2169 against each budget line item. This report will provide the manager with data to determine what element of cost is causing the deviation from the budget plan. Actual man-hour expenditures per mile, for example, can be computed and compared with standard used in the budget plan. The same can be done for material expenditures.

APPENDIX I. TYPES OF WEIGHT HANDLING EQUIPMENT

Cranes

<u>Type and subtype</u>	<u>Description</u>	<u>Fig. No.</u>
<u>Overhead traveling</u> . . .	A crane on a pair of parallel elevated runways, adapted to lift and lower a load and carry it horizontally parallel to, or at right angles to, the runways. It consists of one or more trolleys operating on top or bottom of a bridge which in turn consists of one or more girders or trusses mounted on trucks operating on the elevated runways. Operation is limited to the area between the runways.	I-1
<u>Monorail</u>	An overhead traveling crane composed of a monorail hoist and a traveling rail beam, which may be mounted above or below the runway beams.	...
<u>Gantry</u>	A crane similar to an overhead traveling crane, except that the bridge for carrying the trolley or trolleys is rigidly supported on two or more legs. The assemblage moves on fixed rails or other form of runway.	I-2
<u>Semigantry</u>	A gantry crane with one end of the bridge rigidly supported on one or more legs that run on a fixed rail or runway, the other end of the bridge being supported by a truck running on an elevated rail or runway.	I-2
<u>Cantilever gantry</u> .	A crane in which the bridge girders or trusses extend transversely beyond the crane runway on one or both sides.	I-2
<u>Portal</u>	A fixed or mobile gantry crane, without trolley motion, that has a boom attached to a revolving crane mounted on the gantry, with the boom capable of being raised or lowered at its head (outer end).	I-2
<u>Semiportal</u>	A portal crane mounted on a semigantry type frame.	
<u>Tower</u>	A portal crane, with or without an opening between the legs of its supporting structure, mounted on a fixed or mobile towerlike gantry and adapted to hoist and swing loads over high obstructions. The revolving crane may be supported on the tower by a revolving mast (pintle) or by a turntable.	I-2
<u>Hammerhead</u>	A rotating counterbalanced cantilever equipped with one or more trolleys and supported by a pintle or turntable on a traveling or fixed tower.	I-2
<u>Level luffing</u>	A crane arranged so that the boom-luffing motion moves the suspended load horizontally without vertical displacement.	I-3

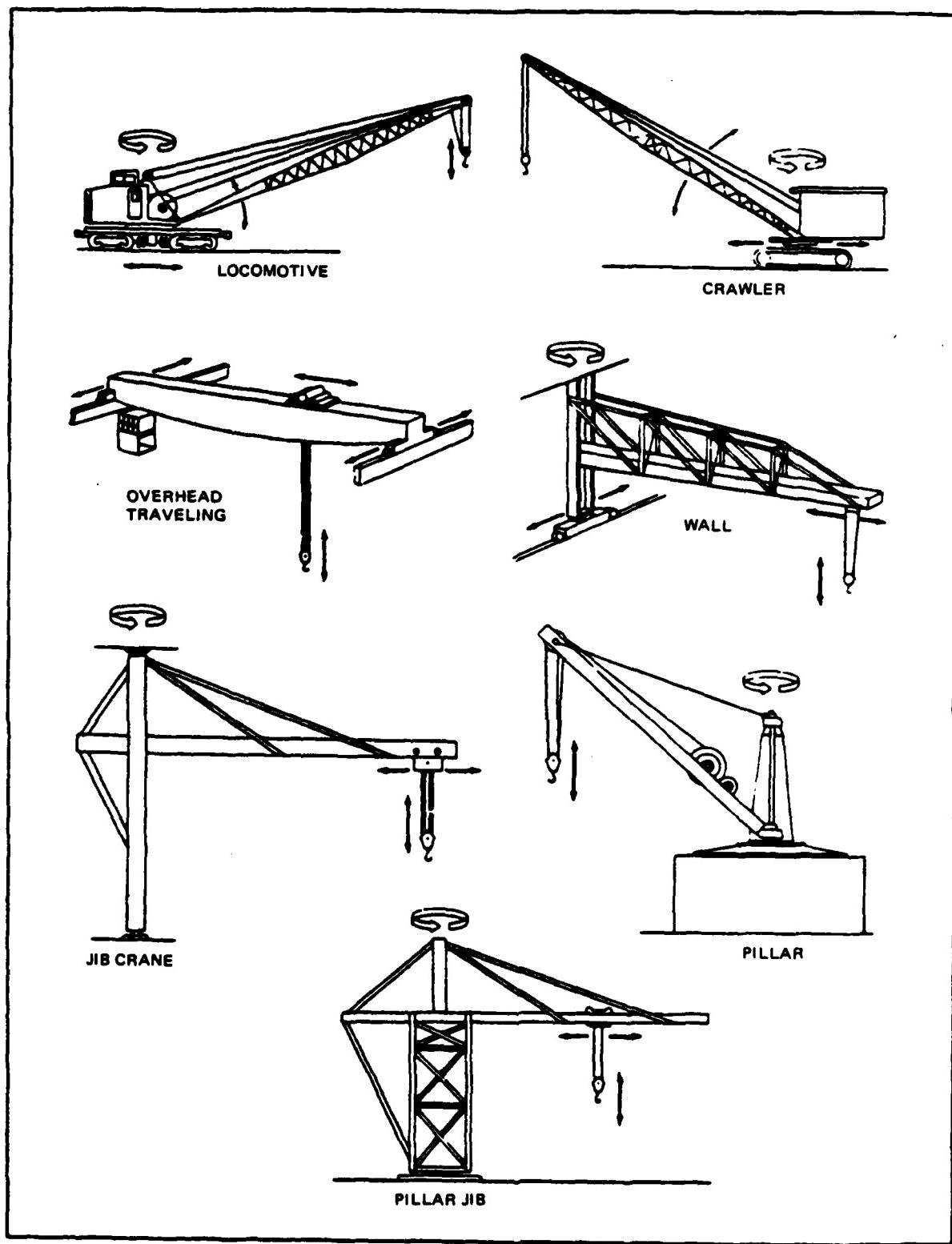


Figure I-1
Types of Cranes-I

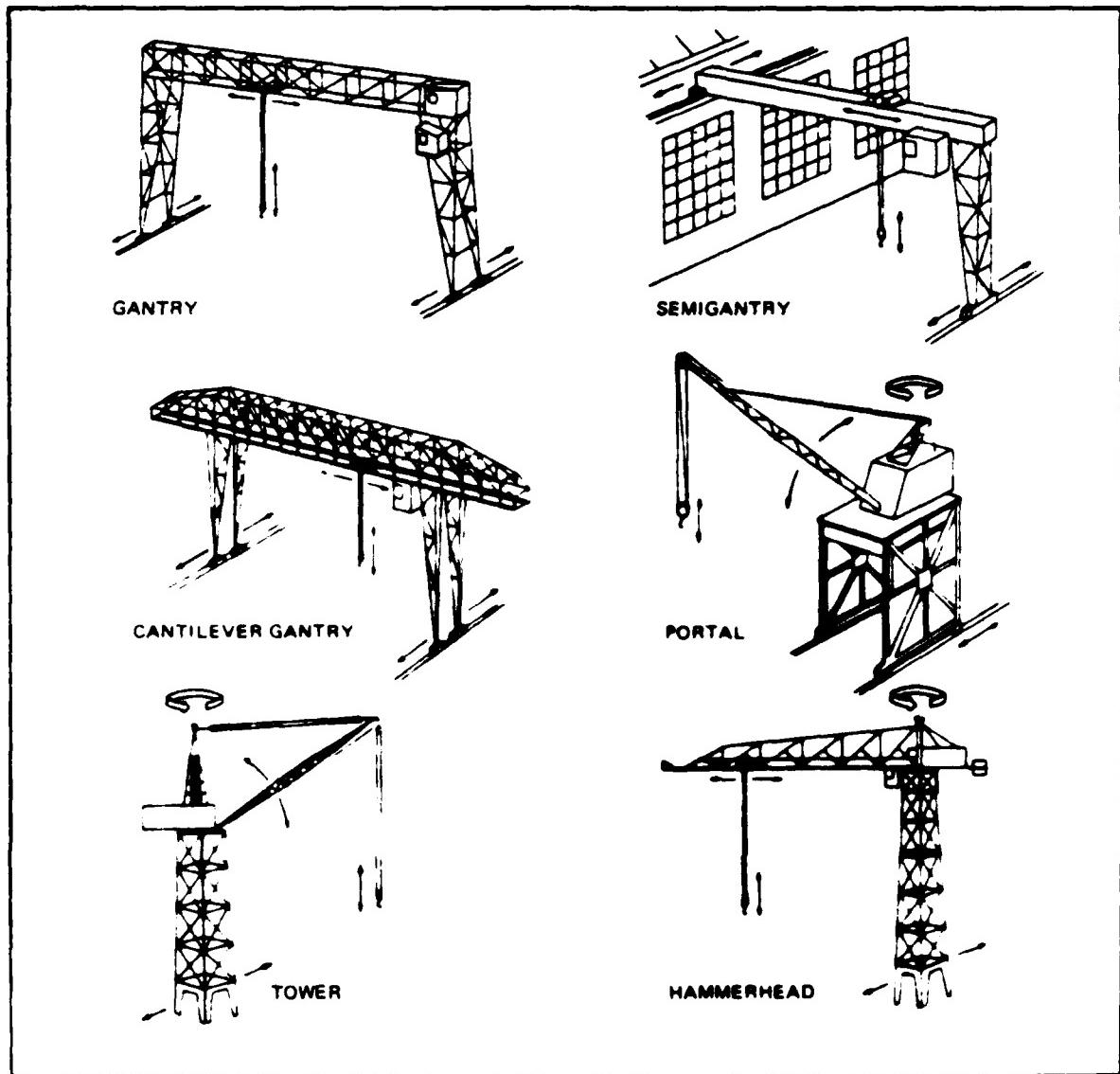


Figure I-2
Types of Cranes-II

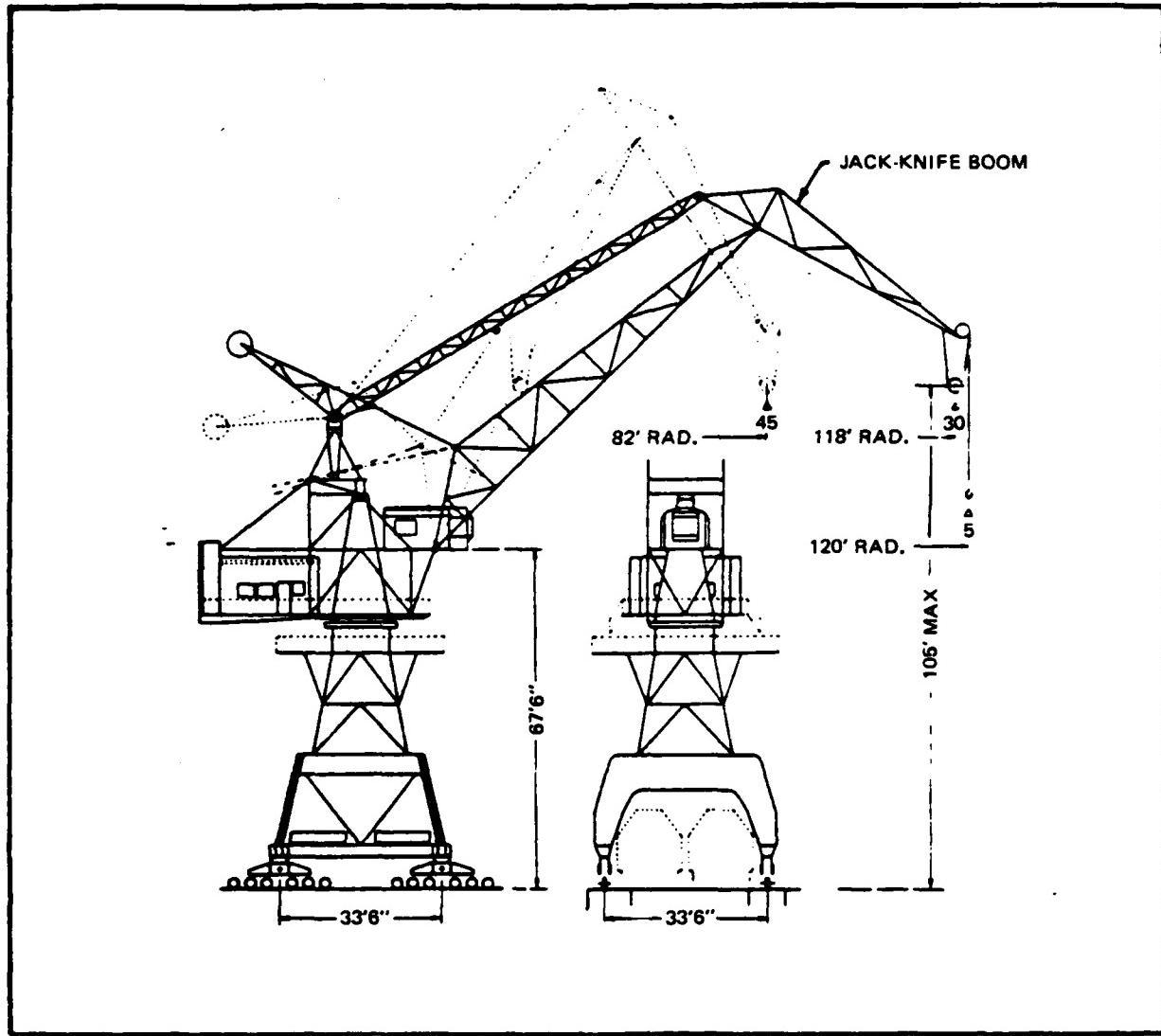


Figure I-3
45-ton Level-Luffing Crane

Fixed

- Pillar A fixed crane consisting of a vertical member held in position at the base to resist overturning moment, with a constant-radius revolving boom supported at the outer end by a tension member. I-1
- Pillar-Jib A fixed crane consisting of a vertical member held at the base, with a horizontal revolving arm carrying a trolley. I-1
- Jib A fixed crane consisting of a fixed vertical member, supported at top and bottom, from which extends a horizontal revolving arm carrying a trolley. I-1

Mobile

- Locomotive A crane consisting of a rotating superstructure with power plant, operating machinery, and a boom capable of being raised or lowered at its head (outer end), mounted on a base or car equipped for self-propelled or propelled by an outside source. Its function is to hoist and swing loads at various radii. I-1
- Crawler A crane consisting of a rotating superstructure with power plant, operating machinery, and a boom capable of being raised or lowered at its head (outer end), mounted on a base equipped with crawler treads for travel. Its function is to hoist and swing loads at various radii. I-1
- Truck A crane consisting of a rotating superstructure with power plant, operating machinery, and a boom capable of being raised or lowered at its head (outer end), mounted on a automotive truck equipped with a power plant for travel. Its function is to hoist and swing loads at various radii. ..
- Cruiser (Wagon Crane) A crane consisting of a rotating superstructure with power plant, operating machinery, and a boom capable of being raised or lowered at its head (outer end), mounted on a base or platform equipped with axles and rubber-tired wheels for travel. The base is usually propelled by the engine in the superstructure, but it may be equipped with a separate engine controlled from the superstructure. Its function is to hoist and swing loads at various radii. ...
- Floating A crane with an integral base consisting of a pontoon, barge, or hull. I-4
- Wall A crane having a jib with or without a trolley and supported from a sidewall or line of columns of a building so as to swing through a half circle only. A wall crane is usually of the traveling type, in which case it operates on a runway attached to the sidewall or columns. I-1

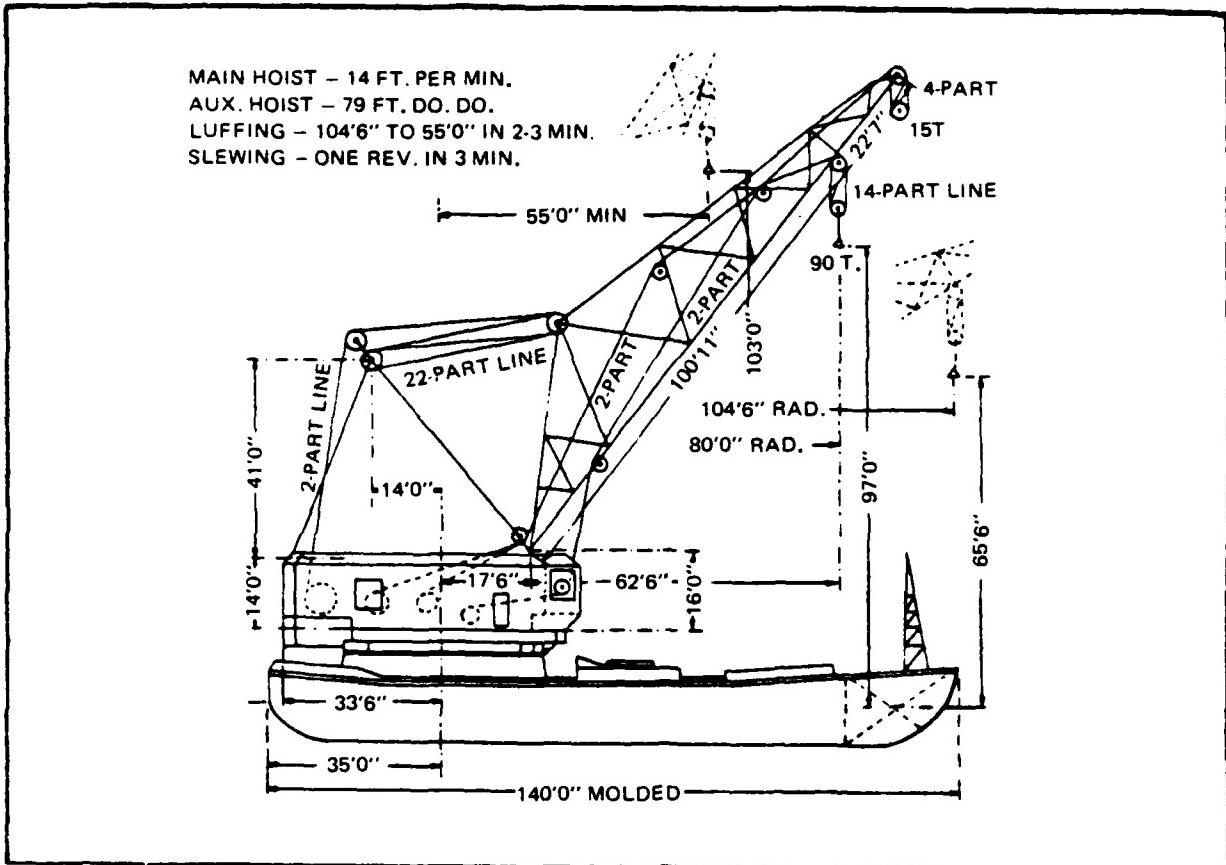


Figure I-4
90-ton Floating Crane

Storage bridge A long-span gantry crane with one or more fixed or hinged cantilever ends. Used for bulk storage of material. . . .

Derricks

Type	Description	Fig. No.
<u>A-frame</u>	One in which the boom is hinged from a cross member between the bottom ends of two upright members spread apart at the lower ends and united at the top, the upper end of the boom being secured to the upper junction of the side members, and the side members braced or guyed from the junction point.	I-5
<u>Breast</u>	A derrick without a boom, the mast consisting of two side members spread farther apart at the base than at the top and tied together at top and bottom by rigid members, the top held from tipping by guys, and the load raised and lowered by ropes through a sheave or block secured to the top crosspiece.	I-5
<u>Gin-pole</u>	One consisting only of a mast, with guys from its top arranged to permit leaning the mast in any direction, the load being raised or lowered by ropes leading through sheaves or blocks at the top of the mast.	I-5
<u>Guyed</u>	A fixed derrick consisting of a mast, capable of being rotated, that is supported in a vertical position by three or more guys, and a boom with its bottom end hinged or pivoted to move in a vertical plane; lines between the head of the mast and the head of the boom are used for raising and lowering the boom, and lines from the head of the boom for raising or lowering the load.	I-5
<u>Stiff leg</u>	Similar to a guy derrick except that the mast is supported or held in place by two or more stiff members capable of resisting both tensile and compressive forces. Sills are generally provided to connect the lower ends of the two stiff legs to the foot of the mast.	I-5
<u>Floating</u>	A floating derrick, which is constructed integrally with a floating base, may be of any type, but usually is either an A-frame or a stiff leg type. . . .	

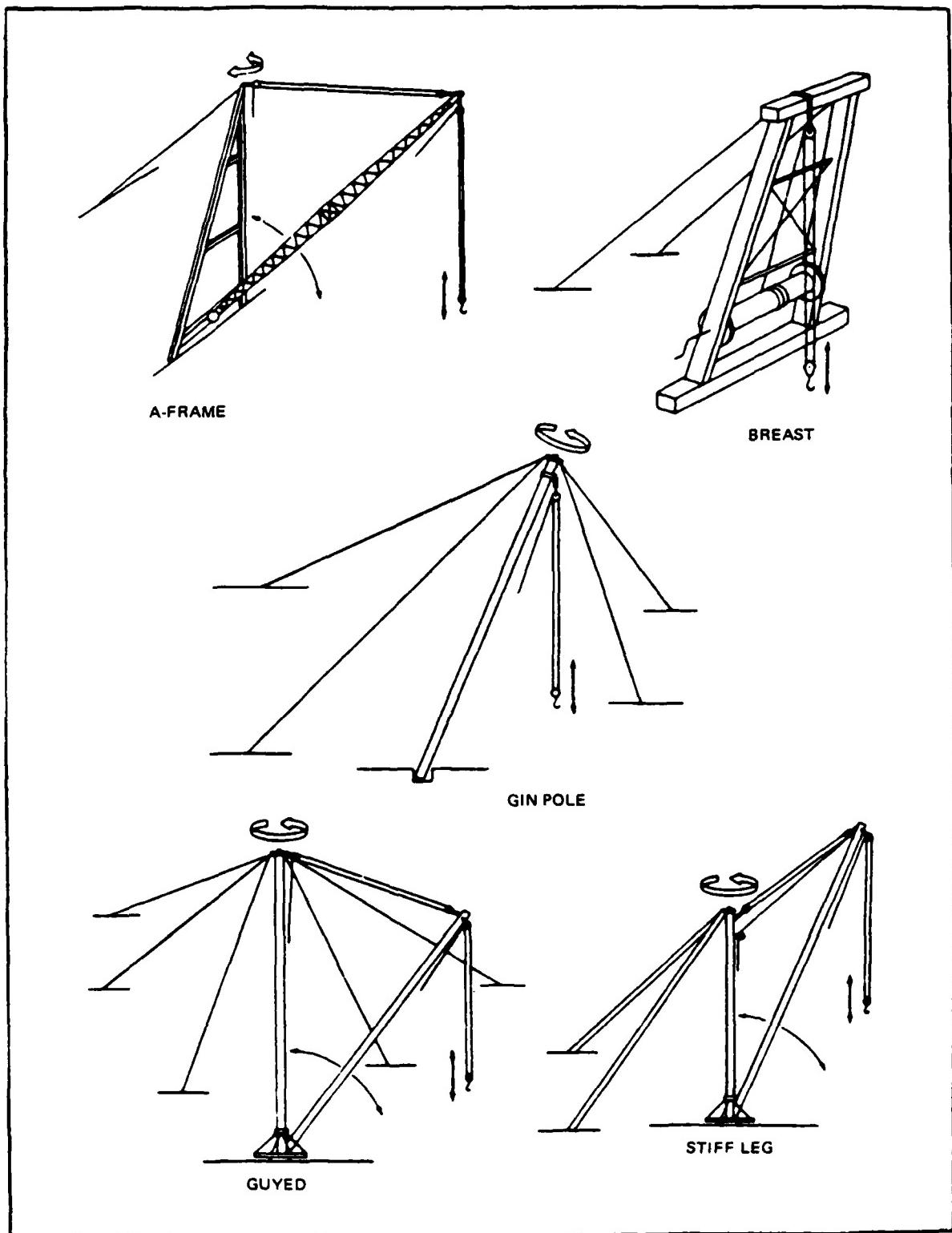


Figure I-5
Types of Derricks

Hoists and Winches

<u>Types and subtype</u>	<u>Description</u>	<u>Fig. No.</u>
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HOISTS

Suspension

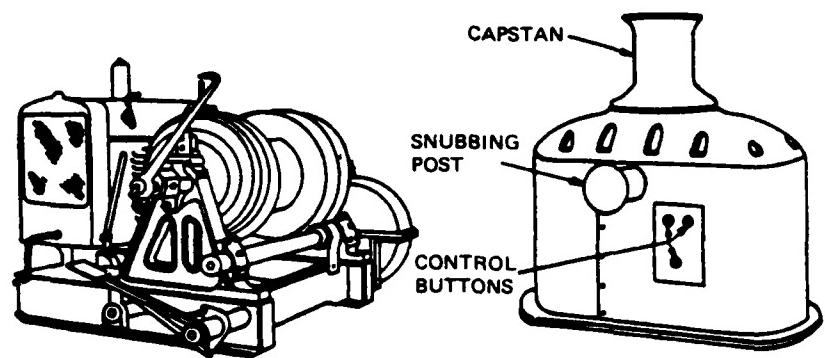
Clevis suspension	Utilizes a clevis for the upper suspension member.	...
Hook suspension	Utilizes a hook for the upper suspension member.	...
Trolley suspension	Utilizes a trolley as upper suspension member for the purpose of running hoist below a suitable runway.	...
Monorail	A trolley suspension hoist in which the trolley is suspended from a monorail.	...
<u>Simple drum</u>	A hoist with one or more drums controlled by manu- ally operated clutches and brakes, or by ratchet and pawl on the drum, with control levers. This type of hoist, known as a "contractor's hoist," is usually a portable unit.	...
Single-drum	A simple drum hoist having only one hoisting drum.	...
Single-fixed drum	A simple drum hoist with the drum geared directly to the power unit instead of by means of friction clutches.	...
Double-drum	A simple drum hoist having two independent hoisting drums.	...
Triple-drum	A simple drum hoist having three independent hoisting drums.	...

Overhead

Electric	A fixed or traveling motor-driven hoist having one or more drums or sheaves for rope or chain.	...
Hydraulic		
Pneumatic		

WINCHES

<u>Hand-operated</u>	Operate by means of a hand crank and gear or pinion to transmit power to drum.	...
<u>Powered operated</u>	Arrangement similar to hand operated winch. Source of power may be steam, gasoline, or diesel engine, electric, hydraulic or pneumatic motor.	I-6
<u>Capstan</u>	A stationary vertical-shaft concave drum for winding rope or chain for hoisting or haulage purposes.	I-6
<u>Windlass</u>	A windlass is of the same construction as a capstan except that a wildcat (chain grab) replaces the capstan head.	I-6



SINGLE DRUM GASOLINE WINCH CAPSTAN

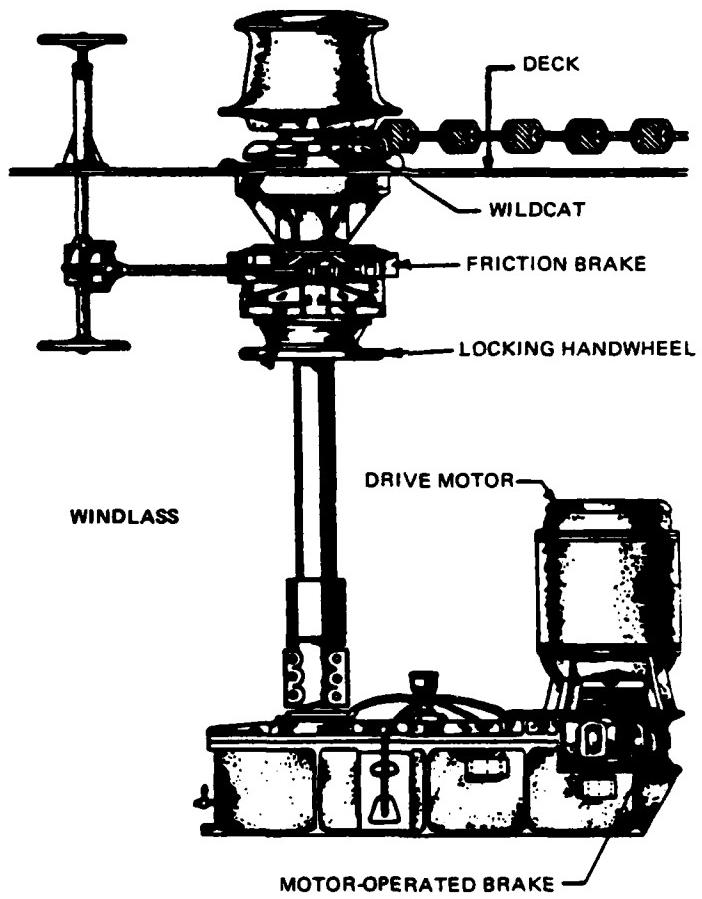


Figure I-6
Types of Winches

Monorails

<u>Type and subtype</u>	<u>Comments</u>	<u>Fig. No.</u>
Tracks		
Structural steel I-beam .	Use for heavy loads and long spans.	I-7
Raised-tread steel track	Adds wear-resisting thickness for longer service life.	I-7
Twin-section track . . .	Use for light loads.	I-7
Rectangular tubing track	Use for light loads.	I-7
Trolleys		
Two-wheel	Trolleys are specified according to the diameter of their wheels and their load-carrying capacity	I-8
Four-wheel		I-8
Eight-wheel		I-8
Hoists		
Manually operated . . .	Slow hook speed.	...
Electrically operated . .	Moderate hook speed.	I-9
Hydraulically or pneumatically operated.		...

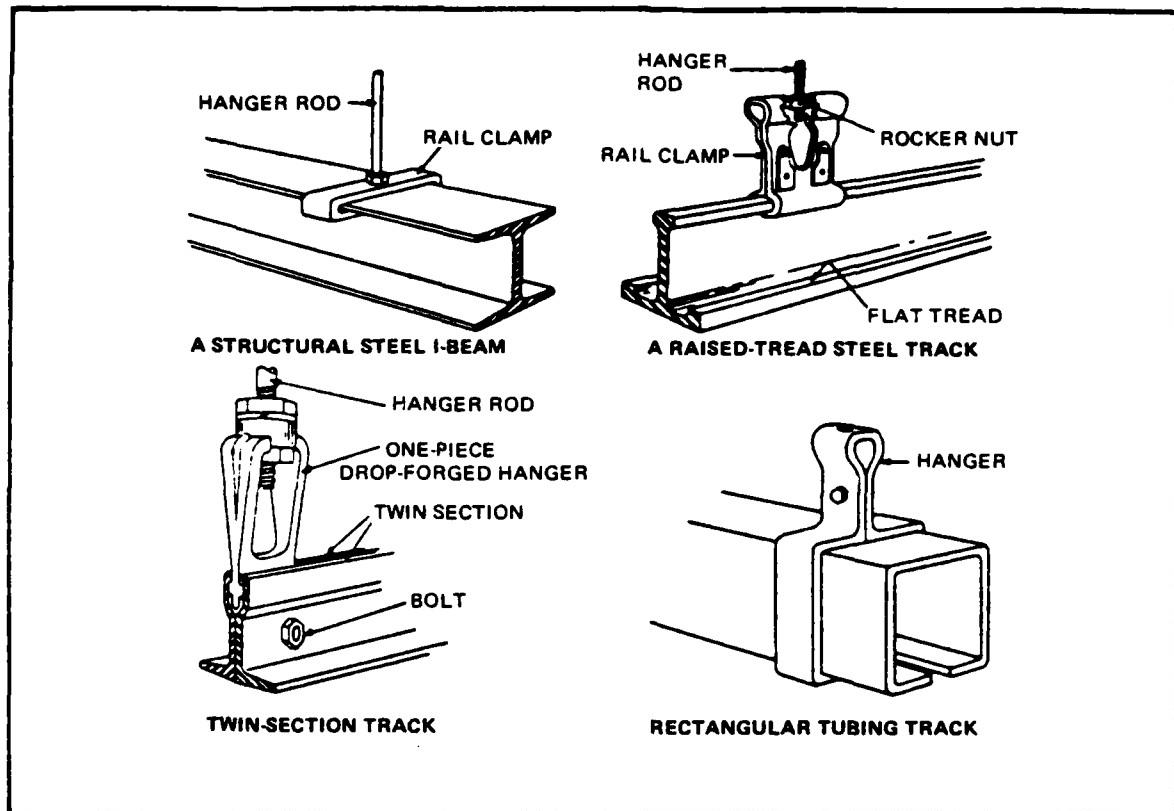
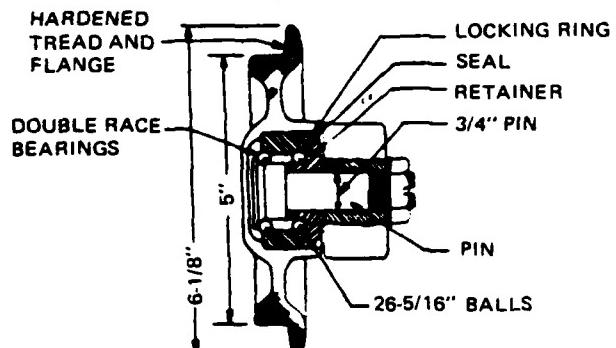
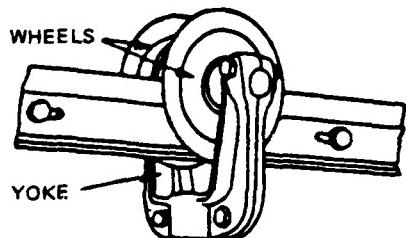


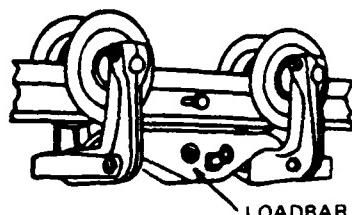
Figure I-7
Typical Monorail Tracks and Hangers



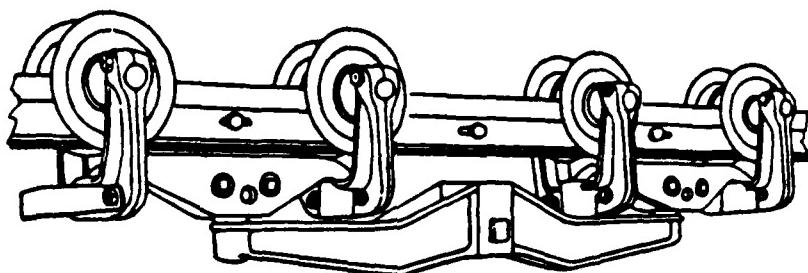
DETAILS OF A 5 in. TROLLEY WHEEL



TWO-WHEEL TROLLEY
CAPACITY: 250-1,000 lb.

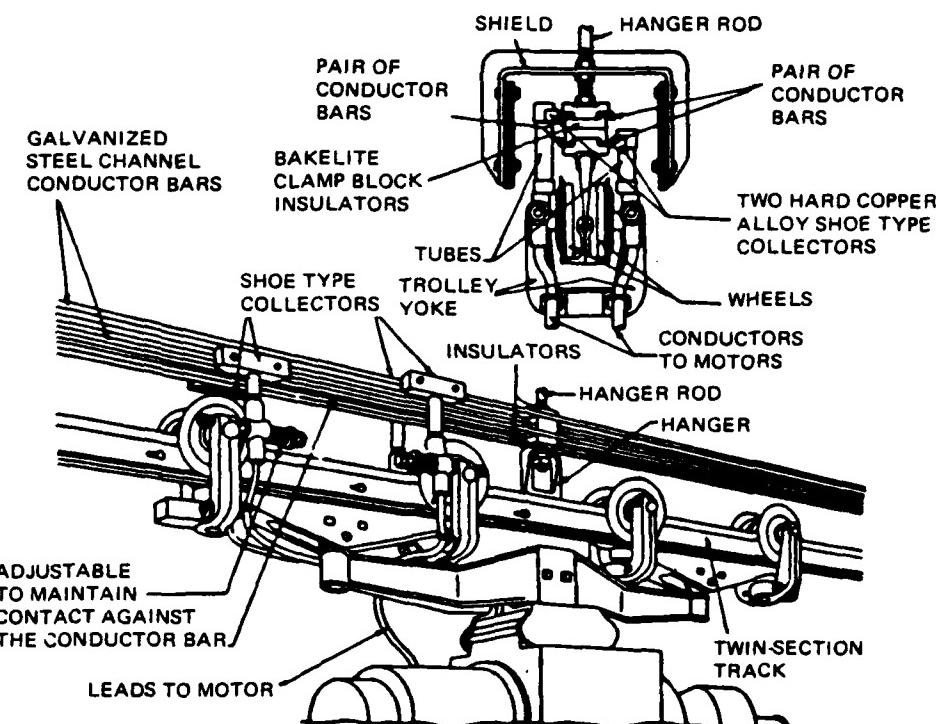


FOUR-WHEEL TROLLEY
CAPACITY: 500-2,000 lb.



EIGHT-WHEEL TROLLEY
CAPACITY: 2,000-4,000 lb.

Figure I-8
Trolleys and Carriers



(THIS FIGURE REPRESENTS ONE OF MANY TYPES.)

Figure I-9
Manual Propelled Carrier
With Electric Hoist

APPENDIX J. CRANE MAINTENANCE INSPECTION SPECIFICATION FOR CATEGORY 1

Portal, Hammerhead, Gantry (Gas/Diesel),
Truck, Cruiser, Crash, Stiff Leg Derrick, Tower,
Crawler, Locomotive, Floating Cranes

INSPECTION
FREQUENCY

- "A" 1. Cooling System Hoses, Thermostat, Pump: Inspect hoses for cracks and clamps for tightness. Check for leaks, shutter operation and antifreeze. Check water pump for noise and leaking seals.
- "A" 2. Lube Oil Lines and Lube Pressure: Inspect lube oil lines for loose connections, leakage and damage. Check gage for proper lube oil pressure. Determine if filters/strainers are being properly serviced/replaced. (See specification.)
- "A" 3. Fuel Oil Lines: Inspect fuel oil pressure and fuel lines for loose connections, leakage and damage. Check fuel pump and fuel pressure gage for proper operation.
- "B" 4. Air Starting Lines: Inspect air lines for loose connections, leakage and damage.
- "B" 5. "V" Belts: Inspect drive belts on fan, water pump, oil pumps, supercharger, alternator, and external fuel oil transfer pumps for belt tension and wear.
- "B" 6. Engine Alternator-Generator: Inspect for cleanliness, noise, rubbing, excessive vibration, proper lubrication and loose parts. Check generator leads for exposed bare conductors, fraying, cracked, peeled insulation, and for excessive oil or grease. Check commutator and brushes for wear, excessive sparking. (See specification.)
- "B" 7. Battery and Cables: Check battery for proper electrolyte level, dirt, structural distortion, loose terminals and racks or holders. Check battery cables for loose cable connections and deterioration.
- "B" 8. Voltage Regulator: Check voltage regulator for proper operation, loose or damaged wire and connections.
- "B" 9. Engine Wiring: Check all battery wiring to lights, warning devices and meter connections for cracks or peeled insulation, fraying and deterioration. Check for loose connections.
- "B" 10. Gauges - Oil, Fuel, Temperature, Ammeter, Tachometer: Check gauges for proper shielding and mountings, legibility and identification, and condition. Check for loose electrical or mechanical connections. Check for proper operation.

- "B" 11. Supercharger and Drive: Check supercharger for excessive noise, vibration, wear, loose mounting bolts and parts. Check external drive shaft and couplings for wear.
- "B" 12. Governor: Check governor linkage for any binding parts. Check fuel control linkage for worn pins, bushings, damaged or loose parts. Check lubricant oil level.
- "A" 13. Fuel Filters: Check for leaks and loose connection, and determine if filters are being properly serviced/replaced. (See specification.)
- "A" 14. Air Cleaner: Check mounting bolts/brackets and/or determine if properly serviced. Check oil level filter element.
- "B" 15. Throttle Linkage: Check all linkage for binding and free operation. Check pins and bushings for wear.
- "B" 16. Clutch - Main Drive: Check clutch linkage, clutch throw out bearing and collar, toggle pins for wear. Check clutch for adjustment. (See specification.)
- "C" 17. Exhaust System: Check exhaust system for leaks, holes, loose mounting bolts, gaskets, and proper insulation and spark arrestors where applicable.
- "B" 18. Ignition/Carburetion System: Check for easy starting and proper operation. Inspect spark plugs for proper setting and cleanliness, spark plug wires, coil and distributor (where applicable).
- "A" 19. Clutches - Boom, Hoists, Swing, Traveling: Inspect clutch linkage for damage, loose or worn pins and proper lubrication. Check clutch lining for wear, drums for smoothness. Check clutch adjustment. (See specification.)
- "A" 20. Mechanical Brakes - Boom, Hoists, Swing, Traveling: Inspect brake lining for wear, drums for smoothness, loose or worn pins, missing or broken parts. Check brakes for adjustment and alignment. (See specification.) Exclude chassis travel brakes on truck, cruiser and crash cranes. The latter to be performed at type "B" inspection.
- "A" 21. Hydraulic Brake System: Inspect brake lining for wear, drums for smoothness, loose or worn pins, missing or broken parts. Check brakes for adjustment and alignment. Check hydraulic brake fluid level in master cylinders. If low, inspect for leakage. Inspect lines for damage, loose connections and leakage. Exclude chassis travel brakes on truck, cruiser and crash cranes. The latter to be performed at type "B" inspection.
- "A" 22. Air Brake System: Inspect brake lining for wear, drums for smoothness, loose or worn pins, missing or broken parts. Check brakes for adjustment. Inspect air application valves for operation and air leaks. Inspect air lines for damage, loose connections and

leakage. Exclude chassis travel brakes on truck, cruiser and crash cranes. The latter to be performed at type "B" inspection.

- "A" 23. Electric Magnetic Brake System: Inspect brake lining for wear and drums for smoothness, loose or worn pins missing or broken parts and bushings for wear. Check brake adjustment and alignment. (See specification.)
- "B" 24. Drive Shafts, Couplings and Gears - External: Inspect external drive shafts for damage, alignment, worn keyways, loose keys and covers. Inspect for excessively chipped or worn gears.
- "C" 25. Drive Shaft, Couplings and Gears - Internal: Check gear case lubrication oil for proper level, evidence of leaking gaskets, and vents. Inspect all drive shaft couplings for loose bolts, worn keyways, loose keys, misalignment and loose shaft. Inspect for excessively chipped or worn gears.
- "B" 26. Bearings - Roller, Ball, Sleeve: Inspect for discoloration due to heat. Check noise, vibration, and lubrication.
- "C" 27. Chains and Sprockets: Inspect for loose or worn links and pins. Inspect sprockets for worn or damaged teeth, loose shaft and keys, and lubrication.
- "A" 28. Pawls and Ratchets: Inspect for loose, damaged or worn pawls and ratchets. Inspect operating linkage, worn keys, loose securing bolts, and broken springs.
- "B" 29. Air Compressor: Check compressor for cleanliness, air output, pressure, air filters and vibration. Inspect air compressor motor alignment, hold-down bolts, air leaks, "V" belt tension and wear.
- "B" 30. Air Control System: Check control and cylinder operation. Inspect valves, cylinders, lines, regulators and gages for worn or missing parts, leaking seals and gaskets. Check air lines for damage or leaking connections.
- "B" 31. Hydraulic Control System: Check control valve operation. Inspect valves, cylinders, lines, regulators and gages for worn or missing parts, leaking gaskets, seals, and loose connections. Check reservoir for proper fluid level.
- "C" 32. Wheels, Wheel Bearings, Axles: Inspect wheels for uneven wear, flat spots, chips, flange wear, cracks, and looseness of axle pins. Inspect wheel bearings for lubrication, wear, loose bearing caps, or loose wheel lugs.
- "A" 33. Tires: Check tire air pressure. Refer to air pressure chart. Inspect tires for damage or excessively worn tread.
- "C" 34. Crawler Tracks: Inspect crawler tracks for damaged or broken treads, missing or broken pins, and track adjustment. Inspect drive sprockets for broken teeth, worn idlers or rollers, bearings, damaged

track adjusting screw, lubrication, and damaged or missing lubrication fittings.

"B" 35. Cable Sheaves and Wire Rope: Inspect for worn or damaged sheaves. Inspect for worn bearings, pins, lubrication, and damaged or missing lubrication fittings. Gauge the wire rope groove of all sheaves. Expose and examine in particular sections in contact with equalizer sheaves and saddles or where corrosion may develop because of poor drainage. Lubricate the inaccessible areas after inspection.

"A" 36. Wire Rope, Fastenings, and Terminal Hardware: Remove wire rope dressing from those areas exposed to maximum wear, exposure, and abuse. Inspect for crushing, kinks, corrosion or other damage, broken wires, and proper lubrication. Check wire rope sockets, swage fittings, eyes, swivels, trunnions, stays, pendants and securing hardware for wear, cracks, corrosion, and other damage. Drum end fittings need only be disconnected and/or disassembled when experience or visible indications deem it necessary.

Wire Rope Rejection Criteria: Remove damaged portions or replace all wire rope exceeding the following:

- (1) Kinks or Crushed Sections: Severe kinks or crushed rope in straight runs where core is forced through outer strands or wires are damaged. (This does not apply to runs around eyes, thimbles, shackles.)
- (2) Flattened Sections: Flattened sections where the diameter across the flat is less than 5/6 of original diameter. (This does not apply to runs around eyes, thimbles, shackles.)
- (3) Wear: Not to exceed 30 percent of any individual outer wire diameter.
- (4) Broken Wires:
 - (a) Running Ropes: The number of broken or torn wires exceeds six randomly distributed broken or torn wires in one lay or three broken wires in one strand in one lay. Replace end connection if there is one or more broken wires adjacent to the end connection.
 - (b) Standing, Guy, and Boom Pendant Ropes: More than two broken wires in one lay in sections beyond end connection or one or more broken wires at an end connection.
- (5) Loss in Diameter. Not to exceed 10 percent of the nominal diameter of the wire rope.
- (6) An accumulation of defects which in the judgment of the inspector creates an unsafe condition.
- (7) Wire rope used in hoisting or lowering and as preventer or pendant shall not contain splices. The rated capacity of the

replacement wire rope for all cranes shall be in accordance with Chapter 21, paragraph 21-5. A certification of the breaking strength of all replacement rope shall be maintained in the equipment history record file.

FOR SPECIAL PURPOSE SERVICE: Refer to NAVSEA 0989-030-7000 for wire rope inspection and replacement requirements.

- "A" 37. Hoisting Blocks and Hooks: Inspect hoisting blocks for cleanliness, damage or worn sheaves, broken bolts, worn pins, and damaged or worn cheek plates. Inspect hooks for damage, wear to hook mousing device, hook swivel trunnions, bearings and securing nuts, broken or missing lubrication fittings, and proper lubrication. Inspect drip pans for securing bolts, gaskets, damage, and clearance. See Appendix L paragraph 1d for further inspection and test of hooks.
- "C" 38. Structural: Inspect complete structure for damage, broken, bent, cracked, loose, corroded, or missing support members.
- "C" 39. Boom and "A" Frame: Inspect complete structure for broken or damaged parts, cracked, corroded, or missing members. Inspect for indicators of loose fasteners, rivets, bolts, welds, and corrosion. Inspect support pins, bushings and retainers, mounting brackets, and lubrication. For damaged booms, see Chapter 24, paragraph 24-5.
- "C" 40. Travel Base Trucks, Equalizers, Gudgeons, Gudgeon Pins, and Bracing: Inspect for broken, cracked, corroded, and damaged components, assemblies, and parts. Inspect for loose fasteners, rivets, bolts, and welds. Visually examine all gudgeons at all areas accessible without major disassembly and removal. Inspect to ensure gudgeon pins are free and providing proper float. Inspect for proper lubrication.
Also after derailment or collision affecting travel base.
- "C" 41. Cab Roller Spider Assembly: Inspect for broken or damaged parts, cracked or missing members. Inspect rollers and roller paths for damage and wear, broken welds, anchor bolts, adjustment alignment and lubrication.
- "C" 42. Center Pin Steadiment Sections and Structural Support Assembly: Inspect for broken or damaged parts, structural cracks, and deformation, broken welds, damage, loose or missing bolts, rivets and parts.
- "C" 43. Cable Drums and Machinery Foundation: Inspect for distortion, missing or loose fasteners, cracked welds, cracked drums, worn cable grooves, drum shaft bearings and lubrication. Ensure at least two complete wraps of wire rope remain on drums with hooks at lowest working level.
- "C" 44. Counterweight: Inspect the condition of the counterweight and counterweight support structure and fasteners, corrosion, deterioration or any other adverse condition.
- "C" 45. Machinery House and Operators Cab: Inspect for leaks, broken glass, corrosion, cleanliness, cable louvers, and proper operation of doors and windows.

- "A" 46. Handrails, Ladders, Walks, and Personnel Safety Guards: Inspect for excessive wear of rungs and steps, deterioration, cracking of side rails, detachment of rungs from side rails, looseness of foundation, attachments to structure, cracked welds, loose or missing rivets, bent or deformed members.
- "B" 47. Auxiliary Hoist Controller: Inspect controller for broken or loose springs, cracked or loose handles, rough or burned contact points and segments. Inspect for broken segment dividers and insulators, contact pressure, excessive arcing, worn or loose cams, pins, rollers, or chains. Inspect conductors for frayed or cracked insulation or loose connections. Check controller indicating lights. Check identifying label plates and direction arrows.
- "B" 48. Whip Hoist Controller: Inspect controller for broken or loose springs, cracked or loose handles, rough or burned contact points and segments. Inspect for broken segment dividers and insulators, contact pressure, excessive arcing, worn or loose cams, pins, rollers, or chains. Inspect conductors for frayed or cracked insulation and loose connections. Check controller indicating lights. Check identifying label plates and direction arrows.
- "B" 49. Swing Controller: Inspect controller for broken or loose springs, cracked or loose handles, rough or burned contact points and segments. Inspect for broken segment dividers and insulators, contact pressure, excessive arcing, worn or loose cams, pins, rollers, or chains. Inspect conductors for frayed or cracked insulation and loose connections. Check controller indicating lights. Check identifying label plates and direction arrows.
- "B" 50. Traveling Controller: Inspect controller for broken or loose springs, cracked or loose handles, rough or burned contact points and segments. Inspect for broken segment dividers and insulators, contact pressure, excessive arcing, worn or loose cams, pins, rollers, or chains. Inspect conductors for frayed or cracked insulation and loose connections. Check controller indicating lights. Check identifying label plates and direction arrows.
- "B" 51. Main Hoist Controller: Inspect controller for broken or loose springs, cracked or loose handles, rough or burned contact points and segments. Inspect for broken segment dividers and insulators, contact pressure, excessive arcing, worn or loose cams, pins, rollers, or chains. Inspect conductors for frayed or cracked insulation and loose connections. Check controller indicating lights. Check identifying label plates and direction arrows.
- "B" 52. Boom Hoist Controller: Inspect controller for broken or loose springs, cracked or loose handles, rough or burned contact points and segments. Inspect for broken segment dividers and insulators, contact pressure, excessive arcing, worn or loose cams, pins, rollers, or chains. Inspect conductors for frayed or cracked insulation and loose connections. Check controller indicating lights. Check identifying label plates and direction arrows.

- "B" 53. Trolley Controller: Inspect controller for broken or loose springs, cracked or loose handles, rough or burned contact points and segments. Inspect for broken segment dividers and insulators, contact pressure, excessive arcing, worn or loose cams, pins, rollers, or chains. Inspect conductors for frayed or cracked insulation and loose connections. Check controller indicating lights. Check identifying label plates and direction arrows.
- "B" 54. Auxiliary Hoist Panel Relays and Coils: Inspect all contacts for proper alignment, signs of excess heating and arcing. Inspect all coil and contact leads, shunts, and wiring. Inspect all fuse or overloading devices for loose connections and signs of overheating. Inspect panel boards and arc shields for cracks, loose securing bolts, dirt, and moisture.
- "B" 55. Whip Hoist Panel Relays and Coils: Inspect all contacts for proper alignment, signs of excess heating and arcing. Inspect all coil and contact leads, shunts, and wiring. Inspect all fuse or overloading devices for loose connections and signs of overheating. Inspect panel boards and arc shields for cracks, loose securing bolts, dirt, and moisture.
- "B" 56. Swing Hoist Panel Relays and Coils: Inspect all contacts for proper alignment, signs of excess heating and arcing. Inspect all coil and contact leads, shunts, and wiring. Inspect all fuse or overloading devices for loose connections and signs of overheating. Inspect panel boards and arc shields for cracks, loose securing bolts, dirt, and moisture.
- "B" 57. Traveling Panel Relays and Coils: Inspect all contacts for proper alignment, signs of excess heating and arcing. Inspect all coil and contact leads, shunts, and wiring. Inspect all fuse or overloading devices for loose connections and signs of overheating. Inspect panel boards and arc shields for cracks, loose securing bolts, dirt, and moisture.
- "B" 58. Main Hoist Panel Relays and Coils: Inspect all contacts for proper alignment, signs of excess heating and arcing. Inspect all coil and contact leads, shunts, and wiring. Inspect all fuse or overloading devices for loose connections and signs of overheating. Inspect panel boards and arc shields for cracks, loose securing bolts, dirt, and moisture.
- "B" 59. Boom Hoist Panel Relays and Coils: Inspect all contacts for proper alignment, signs of excess heating and arcing. Inspect all coil and contact leads, shunts, and wiring. Inspect all fuse or overloading devices for loose connections and signs of overheating. Inspect panel boards and arc shields for cracks, loose securing bolts, dirt, and moisture.
- "B" 60. Trolley Panel Relays and Coils: Inspect all contacts for proper alignment, signs of excess heating and arcing. Inspect all coil and contact leads, shunts, and wiring. Inspect all fuse or overloading

devices for loose connections and signs of overheating. Inspect panel boards and arc shields for cracks, loose securing bolts, dirt, and moisture.

- "B" 61. Compressor Relays: Inspect all contacts for proper alignment, signs of excess heating and arcing. Inspect all coil and contact leads, shunts, and wiring. Inspect all fuses or overloading devices for loose connections and signs of overheating. Inspect panel boards and arc shields for cracks, loose securing bolts, dirt, and moisture.
- "B" 62. Generator Protective Panel Wiring and Connections: Inspect general condition of wiring for deterioration, cracked, or frayed insulation and for loose wire connections. Check all relays, coils, and protection devices. Check all identification labels.
- "B" 63. Resistors: Inspect all speed control resistors and insulators for damage, broken grids, loose connections, securing bolts, and brackets. Check for corroded or high resistant connections.
- "B" 64. Bypass Switches: Remove cover and inspect contact points for pitting, burning, and cleanliness.
- "B" 65. Limit Switches: Remove covers and inspect all electrical and mechanical components such as contacts, springs, ratchets, pins, arms and insulators, rollers, chains, cams, and dogs. Inspect cover gaskets, counter weights, control weights, suspension guides and cables, and mountings.
- "A" 66. Warning Devices--Horns, Bells, Lights: Check operation of electrical and mechanical warning devices. Inspect associated wiring, connections, and control switches. Inspect fixtures, mountings, linkage, pins, springs, and bell hammers.
- "B" 67. Lighting Illumination: Inspect if all lights are operating. Check light fixtures and mountings, wiring connections and switches.
- "B" 68. Motor and Generators: Inspect for weather damage and moisture. Inspect collector rings and commutator for pits, burned spots, or uneven wear. Check motor brushes and brush tension. Inspect leads, insulators, insulation, loose wires and connections. Check for any unusual noise and inspect for loose hold-down bolts, bent shafts, covers, and lubrication.
- "B" 69. Auxiliary Hoist Motor: Inspect for weather damage and moisture. Inspect collector rings and commutator for pits, burned spots, or uneven wear. Check motor brushes and brush tension. Inspect leads, insulators, insulation, loose wires and connections. Check for any unusual noise and inspect for loose hold-down bolts, bent shafts, covers, and lubrication.
- "B" 70. Whip Hoist Motor: Inspect for weather damage and moisture. Inspect collector rings and commutator for pits, burned spots, or uneven wear. Check motor brushes and brush tension. Inspect leads, insulators, insulation, loose wires and connections. Check for any

unusual noise and inspect for loose hold-down bolts, bent shafts, covers, and lubrication.

- "B" 71. Swing Motor: Inspect for weather damage and moisture. Inspect collector rings and commutator for pits, burned spots, or uneven wear. Check motor brushes and brush tension. Inspect leads, insulators, insulation, loose wires and connections. Check for any unusual noise and inspect for loose hold-down bolts, bent shafts, covers, and lubrication.
- "B" 72. Traveling Motor: Inspect for weather damage and moisture. Inspect collector rings and commutator for pits, burned spots, or uneven wear. Check motor brushes and brush tension. Inspect leads, insulators, insulation, loose wires and connections. Check for any unusual noise and inspect for loose hold-down bolts, bent shafts, covers, and lubrication.
- "B" 73. Boom Hoist Motor: Inspect for weather damage and moisture. Inspect collector rings and commutator for pits, burned spots, or uneven wear. Check motor brushes and brush tension. Inspect leads, insulators, insulation, loose wires and connections. Check for any unusual noise and inspect for loose hold-down bolts, bent shafts, covers, and lubrication.
- "B" 74. Main Hoist Motor: Inspect for weather damage and moisture. Inspect collector rings and commutator for pits, burned spots, or uneven wear. Check motor brushes and brush tension. Inspect leads, insulators, insulation, loose wires and connections. Check for any unusual noise and inspect for loose hold-down bolts, bent shafts, covers, and lubrication.
- "B" 75. Trolley Motor: Inspect for weather damage and moisture. Inspect collector rings and commutator for pits, burned spots, or uneven wear. Check motor brushes and brush tension. Inspect leads, insulators, insulation, loose wires and connections. Check for any unusual noise and inspect for loose hold-down bolts, bent shafts, covers, and lubrication.
- "C" 76. Heat Exchanger: Check operation by observing temperature gauges. Inspect for oil and water leaks and loose mounting bolts.
- "C" 77. Fuel Tank: Inspect fuel tank for leaks, water, dirt, condition of gauge, loose or missing bolts and straps, fuel strainers, filters, and proper venting.
- "C" 78. Valve Clearance: Remove valve covers and measure valve clearances by the use of a gauge (see specification).
- "C" 79. Engine RPM: Check for correct engine rpm (see specification).
- "B" 80. Balance Engine: Inspect pyrometer and thermocouplers for proper functioning. Check temperature readings for each cylinder under load and observe individual fuel pump rack positions. Check injectors for proper operation. (See specification.)

- "C" 81. Starter: Operate starter and check for excessive noise in b-
- dix drive. Check commutator for signs of arcing. Inspect brushes,
- wiring, connections, and lubrication.
- "C" 82. Magnetic Brakes, Coils, Wiring: Check solenoid air gap; evi-
- dence of overheating; damaged or worn brass, air gap material, and
- loose core laminations.
- "C" 83. Center Collector Assembly (Electrical or Hydraulic): Inspect
- for loose or bent supports. Check for broken wires, tubing, or loose
- connections, worn brushes, spring tension, and insulation. Check
- collector ring alignment.
- "C" 84. Engine Cylinder Compression: Check compression by use of cylin-
- der compression gauge or check crankcase pressure which may indicate
- cylinder seal problems (see specification).
- "B" 85. Engine Alarm Safety Switches: Check operation of engine over-
- speed shutdown, oil pressure and temperature shutdown, and alarm sys-
- tems. Inspect wiring and connections.
- "A" 86. Operation of Crane Controls: Operate all controls and check for
- proper operation.
- "A" 87. Load Indicator: Check that load indicators are operating cor-
- rectly.
- "B" 88. Radius Indicator: Check correct indication of radius indicator
- by measuring at least two radii.
- "A" 89. Load Charts: Verify that correct load rating charts and hook
- load ratings are posted in view of operator.
- "A" 90. Outriggers: Inspect condition of outrigger beams, boxes, pads,
- wedges or locks, and cylinder mountings.
- "A" 91. Fire Protection Equipment: Ensure proper fire protection equip-
- ment is available and in satisfactory condition.
- "A" 92. Pressure Vessel Inspection: Verify that pressure vessel inspec-
- tion certificate(s) is properly posted and current (see NAVFAC MO-322
- Volume 2).

**APPENDIX K. CRANE MAINTENANCE INSPECTION
SPECIFICATION FOR CATEGORIES 2 AND 3**

Bridge/Overhead Traveling, Wall, Gantry (elec), Cantilever
Gantry (elec), Semigantry (elec), Jib, Pillar, Pillar
Jib, and Monorail Category 2 and 3

The following applicable items shall be inspected annually:

STRUCTURAL

1. Bridge and Trucks: Inspect for bent, or damaged members, evidence of loose bolts, rivets, guards, and broken welds.
2. Trolley and Rails: Inspect for bent, or damaged members, evidence of loose bolts, rivets, guards, trolley rail clamps, end stops, and broken welds.
3. Runway Rails and Clamps: Inspect for loose, broken or missing rail clamps, bolts, wedges, connectors, runway rail end stops, and rail switches.
4. Handrails, Walkways and Ladders: Inspect for loose, missing, bent, deteriorated or misaligned members, loose bolts, rivets, broken welds and hangers.
5. Bumpers: Inspect for loose, broken, or bent bumper members.
6. Guards: Inspect for loose, missing, broken or bent members.
7. Crane Alignment: Inspect for unusual wear on rails. Check by running crane bridge or trolley assembly against end rail stop to check alignment.
8. Jib Boom: Inspect for bent members, misalignment, worn pins, column fasteners, trolley stops and boom markings for rated capacity.

MECHANICAL

9. Bridge Wheels and Bearings:
 - a. Inspect wheels for wear, flat spots, chips, flange wear, cracks, looseness of axle-pins or securing devices.
 - b. Wheel Bearings: Inspect clearance, chatter, loose bearing caps, and lubrication.
10. Trolley Wheels and Bearings:
 - a. Inspect wheels for wear, flat spots, chips, flange wear, cracks, looseness of axle-pins or securing devices.
 - b. Wheel Bearings: Inspect clearance, chatter, loose bearing caps, and lubrication.

11. Shafts, Couplings, and Bearings: Inspect shafts for vibration, cuts and nicks, loose or worn keyways, and misalignment. Inspect couplings for wear, loose bolts or keys, and misalignment. Inspect bearings for clearance, chatter, loose bearing caps, and proper lubrication.

12. Gears and Cases: Inspect gears for worn teeth, loose set screws, and keys. Inspect guards and covers. Check gear cases for excessive noise and vibration and proper lubrication.

13. Bridge Brakes: Inspect for wear in linkage, pins and cams, weakness of springs, wear and condition of linings, smoothness of drum, and clearance between drum or disks. Inspect for improper solenoid air gap; evidence of overheating; damaged brass, air gap material, and loose core laminations; delay or restriction in opening of brakes. On hydraulic brakes inspect fluid level.

14. Trolley Brakes: Inspect for wear in linkage, pins and cams, weakness of springs, wear and condition of linings, smoothness of drum, and clearance between drum or disks. Inspect for improper solenoid air gap; evidence of overheating; damaged brass, air gap material, and loose core laminations; delay or restriction in opening of brakes. On hydraulic brakes inspect fluid level.

15. Main Hoist Holding Brake: Inspect for wear in linkage, pins and cams, weakness of springs, wear and condition of linings, smoothness of drum, and clearance between drum or disks. Inspect for improper solenoid air gap; evidence of overheating; damaged brass, air gap material, and loose core laminations; delay or restriction in opening of brakes. On hydraulic brakes inspect fluid level.

16. Main Hoist Load Brake: Inspect for proper lubrication and oil level, leaks, and proper operation. Ensure that transmission oil has been changed at specified intervals. Insofar as practical using existing inspection ports, inspect condition of screw threads, cams and friction plates; inspect for worn, peened, or chipped ratchets and pawls and for proper clearance between friction plates.

17. Auxiliary Hoist Holding Brake: Inspect for wear in linkage, pins and cams, weakness of springs, wear and condition of linings, smoothness of drum, and clearance between drum or disks. Inspect for improper solenoid air gap; evidence of overheating; damaged brass, air gap material, and loose core laminations; delay or restriction in opening of brakes. On hydraulic brakes inspect fluid level.

18. Auxiliary Hoist Load Brake: Inspect for proper lubrication and oil level leaks, and proper operation. Ensure that transmission oil has been changed at specified intervals. Insofar as practical using existing inspection ports, inspect condition of screw threads, cams and friction plates; inspect for worn, peened, or chipped ratchets and pawls and for proper clearance between friction plates.

19. Sheaves: Inspect for wear, damage, sheave groove radius, worn bushings, pins, pin locking bars and bolts, and lubricating lines and fittings. Gauge the wire rope groove on all sheaves.

20. Load Hooks and Blocks: Inspect for damage wear to hook nuts, mousing device, and hook swivel. Inspect blocks for wear to sheaves and cheek plates. Inspect blocks for loose pins, bolts, and guards. Inspect drip pans for securing bolts, gaskets, damage, and clearance. See Appendix L, paragraph 1d, for further inspection and test of hooks.

21. Wire Rope, Fastenings, and Terminal Hardware: Remove wire rope dressings from those areas exposed to maximum wear, exposure, and abuse. Expose and examine in particular sections in contact with equalizer sheaves and saddles or where corrosion may develop because of poor drainage. Inspect wire rope, sockets, swivels, trunnions, and connections for damage. Inspect wire rope for crushing, kinks, corrosion, broken wires, or other damage and proper lubrication.

a. Wire Rope Rejection Criteria. Remove damaged portions or replace all wire rope exceeding the following:

(1) Kinks or Crushed Sections. Severe kinks or crushed rope in straight runs where core is forced through outer strands or wires are damaged. (This does not apply to runs around eyes, thimbles, shackles.)

(2) Flattened Sections. Flattened sections where the diameter across the flat is less than 5/6 of original diameter. (This does not apply to runs around eyes, thimbles, shackles.)

(3) Wear. Not to exceed 30 percent of any individual outer wire diameter.

(4) Broken Wires. The number of broken or torn wires in running ropes exceeds six randomly distributed broken or torn wires in one lay or three broken wires in one strand in one lay. Replace end connection if there is one or more broken wires adjacent to the end connection.

(5) Loss in Diameter. Not to exceed 10 percent of the nominal diameter of the wire rope.

(6) An accumulation of defects which in the judgment of the inspector creates an unsafe condition.

(7) Wire rope used in hoisting or lowering and as preventor or pendant shall not contain splices.

The rated capacity of the replacement wire rope shall be in accordance with the requirements of Chapter 21, paragraph 21-5. A certification of the breaking strength of all replacement rope shall be maintained in the equipment history record file.

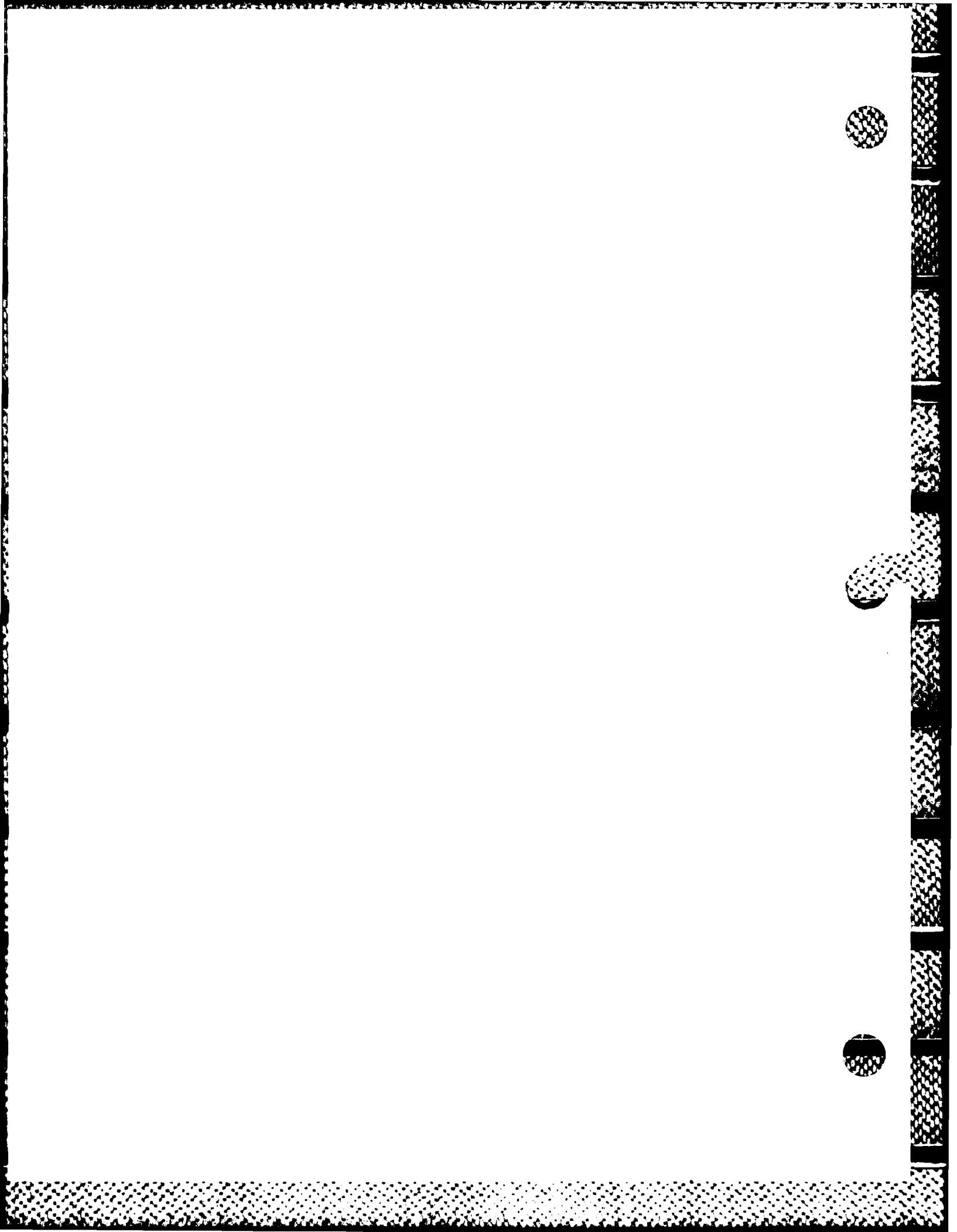
b. For Special Purpose Service. Refer to NAVSEA 0989-030-7000 for wire rope inspection and replacement requirements.

22. Capacity Signs: Inspect for mounting bolts, brackets, and damage. Check markings on load signs for proper rating.

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23. Main Disconnect Switch: Operate switch, inspect for broken or missing support or operating members, overheating, and loose connections.
24. Main Conductors, Collectors: Inspect insulators and clamps, loose connectors, bent, pitted, or damaged wires or collectors, loose or damaged staff or staff insulation, shoes, and loose, damaged, or misaligned wheels.
25. Trolley Conductors, Collectors: Inspect insulators and clamps, loose connectors, bent, pitted, or damaged wires or collectors, loose or damaged staff or staff insulation, shoes, and loose, damaged, or misaligned wheels.
26. Wiring and Fuses: Inspect for damaged insulation, evidence of overheating, and loose connections.
27. Control Panel Relays and Coils: Inspect all contacts for proper alignment, signs of excess heating, or unusual arcing. Inspect all coils, contact leads, shunts and wires, fuses or overload devices for loose connections, and signs of overheating. Inspect panel boards and arc shields for cracks, loose bolts, dirt, and moisture. Check panel markings for legibility. Inspect speed control resistors for damaged insulation, cracked or broken grids, loose connections, bolts, and brackets.
28. Bridge Controller (Electric): Inspect for loose tension springs, broken, cracked, or loose handles, rough or burned contact segments, broken segment dividers and insulators and proper contact pressure, unusual arcing, worn or loose cams, rollers, or pins, and loose connections. Check identifying labels and direction arrows.
29. Trolley Controller: Inspect for loose tension springs, broken, cracked, or loose handles, rough or burned contact segments, broken segment dividers and insulators and proper contact pressure, unusual arcing, worn or loose cams, rollers, or pins, and loose connections. Check identifying labels and direction arrows.
30. Main Hoist Controller: Inspect for loose tension springs, broken, cracked, or loose handles, rough or burned contact segments, broken segment dividers and insulators and proper contact pressure, unusual arcing, worn or loose cams, rollers, or pins, and loose connections. Check identifying labels and direction arrows.
31. Auxiliary Hoist Controllers: Inspect for loose tension springs, broken, cracked, or loose handles, rough or burned contact segments, broken segment dividers and insulators and proper contact pressure, unusual arcing, worn or loose cams, rollers, or pins, and loose connections. Check identifying labels and direction arrows.
32. Bridge Motor: Inspect for damage, bearing noise, vibration and lubrication, sparking and clean lines of commutator and brush wear, loose hold-down bolts and motor brackets. Inspect commutator or slip rings for evidence of overheating and brush sparking. Inspect motor leads and insulators, damaged or deteriorated insulation, and loose connections.

33. Trolley Motor: Inspect for damage, bearing noise, vibration and lubrication, sparking and clean lines of commutator and brush wear, loose hold-down bolts and motor brackets. Inspect commutator or slip rings for evidence of overheating and brush sparking. Inspect motor leads and insulators, damaged or deteriorated insulation, and loose connections.
34. Main Hoist Motor: Inspect for damage, bearing noise, vibration and lubrication, sparking and clean lines of commutator and brush wear, loose hold-down bolts and motor brackets. Inspect commutator or slip rings for evidence of overheating and brush sparking. Inspect motor leads and insulators, damaged or deteriorated insulation, and loose connections.
35. Auxiliary Hoist Motor: Inspect for damage, bearing noise, vibration and lubrication, sparking and clean lines of commutator and brush wear, loose hold-down bolts and motor brackets. Inspect commutator or slip rings for evidence of overheating and brush sparking. Inspect motor leads and insulators, damaged or deteriorated insulation, and loose connections.
36. Hoists, Limit Switches: Remove covers and inspect all electrical and mechanical components for malfunction including contacts, springs, ratchets, pins, arms and insulators, rollers, cams, and dogs. Inspect cover gaskets, counterweights, and guides. Inspect all securing bolts and guards.
37. Lighting System: Inspect lighting fixtures for adequate support, proper location, damage, evidence of overheating, and damaged or broken socket and lens. Inspect switches for proper operation, broken or missing parts, and covers. Inspect conductors for loose or damaged wires, supports, conduit junction boxes and raceways.
38. Heaters and Switches (Personnel Heaters): Inspect for damaged wiring, proper electrical connections, guard/covers, and switch operation.
39. Warning Devices: Inspect for proper operation of sirens, horns, bells, and lights. Check switches and inspect wiring and connections.
40. Operation of Crane Controls: Operate all crane controls and check for proper operation.
41. Load Ratings: Verify that load ratings are correct and are posted in view of operator and riggers.
42. Fire Protection Equipment: Ensure proper fire protection equipment is available and in satisfactory condition.



APPENDIX L. CRANE TEST PROCEDURE

1. General Instructions.

a. Weight handling equipment shall be tested according to the appropriate paragraphs of this procedure depending on the type of equipment. The sequence of testing shall be at the option of the test director except that the no load test must be performed first. Where the crane has more than one hoist, the main hoist should be tested first. The nominal test load shall be 125 percent of rated capacity unless otherwise limited by manufacturer's specifications except for tests of mobile cranes.

b. All test results shall be entered on the "Certification of Load Test and Condition Inspection" (Figure 21-3) for applicable items according to crane type. Appropriate entries shall be recorded in each space. If a space does not pertain to the particular crane being tested, the entry shall be recorded as "Not Applicable" (NA).

c. The inspector shall assist the test director by checking during the load test for improper operation or poor condition of safety devices, electrical components, mechanical equipment, and structural assemblies. Observed defects critical to continued testing shall be reported immediately to the test director who shall suspend testing until the deficiency is corrected.

d. Inspection and Testing of Hooks.

(1) General Inspection. Hooks shall be annually inspected for wear in swivels and pins, other wear, cracks or gouges, and proper operation and condition of safety latches, where installed. Cracks and gouges parallel to contour of the hook shall be removed by surface abrasion and shall result in a smooth surface retaining the profile of the hook. Where cracks and gouges cannot be removed by surface abrasion, the hook shall be discarded. Where cracks and gouges are transverse to the contour of the hook, the hook shall be evaluated for retention or disposal. Defects in the unstressed portion of the hook do not affect strength. No attempt shall be made to correct hook deficiencies by use of heat or welding. Where normal wear or removal of cracks or gouges results in a reduction in the original sectional dimension of 10 percent or more, the hook shall be discarded. Where hook is visually bent or twisted it shall be discarded. No attempt shall be made to straighten bent or twisted hooks.

(2) Hook Throat Spread. Hooks shall be measured for hook throat spread before and after load test. A throat dimension base measurement shall be established by installing two tram points and measuring the distance between these tram points ($\pm 1/64$ inch). This base dimension shall be retained in the equipment history record file for the life of the hook. The distance between tram points shall be measured before and after load test. Hooks showing an increase in the throat opening by more than 5 percent from the base measurement shall be discarded.

(3) Hook Disassembly, Inspection, and Nondestructive Test (NDT). Hook, retaining nut and bearings, shall be disassembled from the block and thoroughly inspected. The hook and retaining nut shall be visually inspected

for thread wear and corrosion damage. Category 1 and 2 crane hooks shall be disassembled and inspected in conjunction with hook NDT. Category 3 crane hooks shall be disassembled and inspected annually prior to load test. Block bearing plate shall be visually inspected for cracks, wear, or other damage. Bearing shall be inspected for unusual wear and free rotation. All components shall be lubricated as required during assembly. Entire hook and retaining nut shall be nondestructively tested for structural defects as follows:

(a) For General Purpose Service Cranes. Nondestructive test of general purpose service (GPS) crane hooks is valid for five (5) certification periods. The effective date of hook inspection and NDT shall be the crane certification date. Nondestructive test methods and acceptance criteria shall be approved by the activity. Nondestructive tests shall be performed prior to load tests.

(b) For Special Purpose Service. Inspection and NDT of special purpose service (SPS) crane hooks is valid for one (1) validation period except as noted in paragraph (4) following. See NAVSEA 0989-030-7000 for additional requirements. The effective date for hook inspection and NDT is the validation date. Nondestructive test shall be performed prior to load test.

(4) The interim replacement of a hook shall be in accordance with Chapter 21, paragraph 21-12. All new or used hooks must be inspected and NDT'd prior to installation. Nondestructive test of replacement hooks shall fulfill the NDT requirements incident to certification and/or validation. Nondestructive test shall be performed within six months prior to validation for SPS cranes.

e. Prerequisites to Load Testing.

(1) A safe test area shall be selected and all traffic and unauthorized personnel and equipment shall be cleared from test area. Test area shall be roped off or otherwise secured to prevent entry of unauthorized personnel and equipment.

(2) All rigging used in crane load testing shall have been previously tested to at least 150 percent of rated working load.

(3) Trackage to be used during crane load tests shall be satisfactory for use per NAVSEA/NAVFACINST 11230.1 or equivalent.

(4) Mobile cranes temporarily mounted on barges shall be removed from the barge for load testing (see paragraph 5b).

f. Precautions During Load Testing.

(1) Prescribed tests are overload tests and extreme caution should be observed at all times.

(2) Personnel shall remain clear of suspended loads and areas where they could be struck in the event of boom failure.

(3) Test load shall be raised only to a height sufficient to perform the test.

2. Portal and Floating Cranes.

a. No-Load Test.

(1) Hoist Operating and Limit Switch Test. Accomplish for all hooks as follows: NOTE: Position boom as required.

(a) Raise the respective load hook through all controller points stopping below upper limit switch (where applicable).

(b) Raise load hook into the upper limit switch at SLOW SPEED, to establish that limit switch is operating properly.

(c) Raise hook slowly through the upper limit switch by using installed limit switch bypass (where applicable).

(d) Lower load hook below the upper limit switch using all the lowering control points.

(e) Lower load hook into lower limit switch at SLOW SPEED, to establish that limit switch is operating properly.

(2) Boom. Boom operating and limit switch test shall be accomplished as follows:

(a) Raise boom through all controller points, stopping below upper limit switch.

(b) Raise boom into the upper limit switch slowly.

(c) Lower boom below limit switch and raise boom through limit switch by using installed limit switch bypass (where applicable).

(d) Lower boom through all controller points, stopping above boom lower limit switch (where applicable).

(e) Lower the boom into the boom lower limit switch slowly (where applicable).

(f) Raise boom above the lower limit switch and lower boom through limit switch by using installed limit switch bypass (where applicable).

(3) Luffing Drum Pawl. Check luffing drum pawl for proper engagement in ratchet gear and with limit switch. Ensure luffing drum pawl is disengaged. Check the luffing drum pawl limit switch (if installed) for proper operation by operating the boom hoist and manually (at the pawl) activating the limit switch. Check that boom hoist motor shuts off, brake engages, and indicator lights operate correctly (where applicable).

Caution: Do not engage pawl in the ratchet gear.

(4) Rotation Lock (Wind Lock, Spud Lock). Engage rotation lock and inspect to ensure full engagement. Check that rotation lock limit switches

(clockwise and counterclockwise) prevent engaging rotation drive (where applicable). Operate rotation lock bypass (clockwise and counterclockwise) to ensure proper operation (where applicable). Caution: Use only enough power to check operation of bypass. NOTE: Applicable switches may be operated manually to check for correct operation in lieu of engaging rotation lock. Caution: Ensure rotation lock is disengaged prior to continuing test.

(5) Rotation. Rotate clockwise and counterclockwise with boom at minimum radius.

(6) Travel. Conduct operation travel test in accordance with paragraph 2b(3)(m) except without load.

(7) Deadman Controls. Test all deadman controls (where installed). Start each motion, release deadman control; motion should stop.

b. Load Test. The following is considered to be the most time and cost effective sequence of performing the required tests. Activities may vary the sequence as required.

(1) Load Test for Variable Rated Cranes. All cranes will be tested in accordance with paragraphs (2) through (5) following. In addition, variable rated cranes will be tested in accordance with paragraph 2c at the maximum radius of the crane.

(2) Stability Test. During static and dynamic configurations with test load (paragraphs 2b(3)(a), (b), (d) and (j) following) observe rollers for lift-off from roller path. If no lift-off is observed, stability is satisfactory. If lift-off is observed, check contact of stediment with center pin nut. If no contact is observed, check for lift-off of rollers from roller path with rated load. If lift-off of rollers is observed with rated load or contact of stediment with center pin nut with test load is observed, the crane shall be removed from service and request for engineering evaluation shall be forwarded to NAVFACENGCOM, Code 0453D.

(3) Main Hoist. Maximum test load for the crane.

(a) Hoist and Boom Static Test. Raise test load to clear ground and hold for 10 minutes with boom at maximum radius. Rotate load and hook to check bearing operation. Do not engage boom or load hoist pawl (dog). Observe lowering that may occur which indicates malfunction of boom or hoisting components or holding brakes.

(b) Hoist Dynamic Test. Raise and lower test load on each hoist controller point and visually observe smooth control between points. Lower the test load to unload the hoist components, wait 5 minutes, and continue test.

(c) Wire Rope Test. During either the static or dynamic test, where possible, test the entire working length of the wire rope.

(d) Boom Hoist Operating Test. Starting from maximum radius and with the load attached raise the boom to minimum radius using all boom

controller points. Lower the boom through all boom controller points. Visually observe for smooth motion between boom controller points.

(e) Hoist Foot Brake Test (Hydraulic or Mechanical). Lower test load, using first control point, then apply the foot brake. This should stop the lowering motion of the test load. Caution: Not applicable to load-sensitive reactor type hoist controls.

(f) Boom Foot Brake Test (Hydraulic or Mechanical). Start with boom near maximum radius, and with the test load approximately 2 feet from the ground surface, lower test load, using first control point of the boom hoist. Apply the foot (hydraulic/mechanical) brake. This should stop the lowering motion of the boom and test load. Caution: Not applicable to load-sensitive reactor type hoist controls.

(g) Automatic Boom Brake (Where applicable, i.e., Washington Crane Company). This brake is to prevent a "free" boom in case of failure of clutch, boom hoist control, and foot brake. Raise the boom to minimum radius and with the test load approximately 4 inches above the ground, set the boom foot brake firmly. Release the mechanical boom dog. Release the boom clutch by operating the boom hoist control. Slowly release the foot brake to the free position. Hold the test load with automatic brake for 5 minutes then lower test load by applying the boom hoist clutch and lowering with the controller operation.

(h) Hoist Loss of Power (Panic Test). This test is designed to test the reaction of a hoisting unit in the event of power failure during a lift. Hoist the test load approximately 10 feet above the ground at maximum allowable radius. Lower test load at slow speed and with the controller in the slow lowering position, disconnect the main power source by pushing the main power stop button or buttons, then return the controller to the neutral position. The test load should stop lowering when the controller is placed in the neutral position. Caution: This test is not to be performed on cranes that do not have powered down boom and load hoists.

(i) Boom Loss of Power (Panic Test). This test is designed to test the reaction of the boom hoist in event of power failure during a lift. Hoist the load approximately 10 feet above the ground with the boom near maximum radius. Lower the boom at slow speed, disconnect the main power source by pushing the main power stop button(s), then return the controller to the neutral position. The boom should stop lowering when the controller is placed in the neutral position. Caution: This test is not to be performed on cranes that do not have powered down boom and load hoists.

(j) Rotation. Start with boom at maximum radius, rotate left and right 360 degrees. However, if test area will not permit, two complete revolutions of the swing drive pinion is considered adequate. For floating cranes, rotation should be limited to an arc where the test load remains over the pier.

(k) Rotate Brake Test. Rotate left and right at slow speed and apply brakes individually. Each brake should demonstrate its ability to stop the rotating motion in a smooth, positive manner.

(1) Travel Motion. This test shall be conducted with the boom at maximum allowable radius positioned 90 degrees with the crane rails and boom dog engaged. Caution: Operate crane at very slow travel speed. Ensure track and supporting foundation is sound and free of any obstruction over test travel area. Not applicable to floating cranes.

(m) Travel Operation Test. With the test load raised to clear the ground and with the boom centered between the crane rails and boom dog engaged, travel in one direction (a minimum of 50 feet). Operate the controller through all controller points. The crane should accelerate and decelerate smoothly. All motions should be smooth and positive. Not applicable to floating cranes.

(n) Repeat the above travel operation test in the opposite direction.

(4) Auxiliary Hoist. Maximum test load for the hoist.

(a) Static Test. Raise test load to clear ground and hold for ten minutes without hoist pawl (dog) engaged. Rotate load and hook to check bearing operation. Observe lowering that may occur which will indicate malfunction of hoisting components or holding brakes.

(b) Dynamic Test. Raise and lower test load on each controller point and visually observe smooth control between points.

(c) Wire Rope Test. During either the static or dynamic test, where possible, test the entire working length of wire rope.

(d) Foot Brake Test (Hydraulic or Mechanical). Lower test load using first control point, then apply the foot brake. This should stop the lowering motion of the test load. Caution: Not applicable to load-sensitive reactor type hoist controls.

(e) Loss of Power (Panic Test). This test is designed to test the reaction of the hoisting unit in the event of power failure during a lift. Hoist the test load approximately 10 feet above the ground at maximum allowable radius. Lower test load at slow speed and with the controller in the slow lowering position, disconnect the main power source by pushing the main power stop button or buttons, then return the controller to the neutral position. The test load should stop lowering when the controller is placed in the neutral position. Caution: This test is not to be performed on cranes that do not have powered down load hoists.

(5) Whip Hoist. Maximum test load for the hoist.

(a) Static Test. Raise test load to clear ground and hold for 10 minutes. Rotate load and hook to check operation of bearing. Observe lowering that may occur which will indicate malfunction of hoisting components or holding brakes.

(b) Dynamic Test. Raise and lower test load on each controller point and visually observe smooth control between points.

(c) Wire Rope Test. During either the static or dynamic test, where possible, test the entire working length of the wire rope.

(d) Foot Brake Test (Hydraulic or Mechanical). Lower test load using first control point, then apply the foot brake. This should stop the lowering motion of the test load. Caution: Not applicable to load-sensitive reactor type hoist controls.

(e) Loss of Power (Panic Test). This test is designed to test the reaction of a hoisting unit in the event of power failure during a lift. Hoist the test load approximately 10 feet above the ground at maximum allowable radius. Lower test load at slow speed and with the controller in the slow lowering position, disconnect the main power source by pushing the main power stop button or buttons, then return the controller to the neutral position. The test load should stop lowering when the controller is placed in the neutral position. Caution: This test is not to be performed on cranes that do not have powered down load hoists.

c. Variable Rated Load Test. In addition to the test prescribed in paragraph 2b, variable rated cranes shall be tested with maximum load at the maximum radius of the crane on the main hoist as follows:

(1) Stability Test. During paragraphs 2c(2), 2c(3), and 2c(7), observe rollers for lift-off from roller path. If no lift-off is observed, stability is satisfactory. If lift-off is observed, check contact of steadi-ment with center pin nut. If no contact is observed, check for lift-off of rollers from roller path with rated load. If lift-off of rollers is observed with rated load or contact of steadi-ment with center pin nut with test load is observed, the crane shall be removed from service and request for engineering evaluation shall be forwarded to NAVFACENGCOM, Code 0453D.

(2) Static Test. Raise test load to clear ground and hold for 10 minutes with boom at maximum radius. Do not engage boom or load hoist pawl (dog). Observe lowering that may occur which indicates malfunction of hoist-ing components or magnetic brakes.

(3) Dynamic Test. Raise and lower test load on each controller point and visually observe smooth control between points. Lower the load to the ground to unload the crane, wait 5 minutes, and continue testing.

(4) Boom Hoist Operating Test. Starting from maximum radius and with the load attached, raise the boom to minimum radius (maximum radius for next higher load) using all controller points. Lower the boom through all controller points. Visually observe for smooth motion between controller points.

(5) Boom Foot Brake Test (Hydraulic or Mechanical). Start with boom near maximum radius, and with the test load approximately two feet from the ground surface, lower test load, using first control point of the boom hoist. Apply the foot (hydraulic/mechanical) brake. This should stop the lowering motion of the boom and test load. Caution: Not applicable to load-sensitive reactor type hoist controls.

(6) Automatic Boom Brake (Where applicable, i.e., Washington Crane Company). This brake is to prevent a "free" boom in case of failure of clutch, boom hoist control, and foot brake. Raise the boom to minimum radius and with the test load approximately 4 inches above the ground, set the boom foot brake firmly. Release the mechanical boom dog. Release the boom clutch by operating the boom hoist control. Slowly release the foot brake to the free position. Hold the test load with automatic brake for 5 minutes then lower test load by applying the boom hoist clutch and lowering with the controller operation.

(7) Rotation. Start with boom at maximum radius, rotate left and right 360 degrees. However, if test area will not permit, two complete revolutions of the swing drive pinion is considered adequate. For floating cranes, rotation should be limited to an arc where the test load remains over the pier.

(8) Travel Motion. This test shall be conducted with the boom at maximum allowable radius positioned 90 degrees with the crane rails and boom dog engaged. Caution: Operate crane at very slow travel speed. Ensure track and supporting foundation is sound and free of any obstruction over test travel area.

3. Tower Cranes and Derricks.

a. General. Tower cranes and stiff leg derricks shall be tested in accordance with instructions for portal cranes under paragraph 2 (except for rotation testing which is described below).

b. Tower Crane and Derrick Rotation. Rotation testing shall be conducted in accordance with rotation test for portal cranes, paragraph 2b(3)(j), through normal design operating arc.

4. Hammerhead Crane.

a. Hammerhead Crane Hoists. Hoists shall be tested in combination(s) such that all structural, mechanical, and electrical components are tested in all possible configurations. Hoists shall be tested in accordance with applicable instructions for portal cranes.

b. Hammerhead Rotation. Rotation shall be tested in accordance with instructions for portal cranes.

c. Hammerhead Trolley Motion.

(1) No load. Trolley the allowable length of the trolley runway using all control points. Operate trolley into the limit switches at slow speed. Bring trolley back and by using the limit switch bypass, move trolley into the outboard rail stops. Repeat above procedure for inboard limit switches and rail stops.

(2) Load Test. Raise test load to clear ground and move trolley to the maximum allowable radius. Hold test load for 10 minutes, do not move trolley beyond the trolley limit switch. Lower test load to ground until

hoist lines are slack, wait 5 minutes and continue test. Raise test load and trolley the allowable length of the trolley runway.

d. Travel. Travel motion shall be tested in accordance with the instructions specified for portal cranes where applicable.

5. Mobile Cranes (Locomotive, Crawler, Truck (Includes All Cranes Mounted on Automotive Truck Chassis), Crash, and Cruiser Cranes).

a. Complete tests shall be performed on each load hook. The nominal test load for truck, crash, cruiser, and locomotive cranes shall be 110 percent of the rated capacity at the minimum and maximum radii. Special purpose service cranes must be tested in accordance with NAVSEA 0989-030-7000. The nominal test load for crawler cranes shall be 125 percent of the rated capacity at the minimum and maximum rated radii. Check accuracy of load indicators where installed.

b. Mobile Cranes Temporarily Mounted on Barges. The following procedures shall apply when mounting mobile cranes on barges.

(1) Load tests as prescribed below will not be performed with crane on barge. Such testing shall be performed ashore.

(2) Manufacturer's load chart and certification prescribed in Chapter 21, paragraph 21-13, for mobile cranes become invalid when crane is mounted on barge.

(3) Certifying officer shall prescribe appropriate test condition, direct posting of reduced capacity charts and appropriate precautions, and provide conditional certification.

c. Pretest Preparation. Select a test course that is level and free of ground obstructions. Extend outriggers or stabilizers as specified by manufacturer, when so equipped. For most truck and cruiser cranes, crane carrier is raised sufficiently to completely unload tires. Level crane as required by manufacturer's load chart. Rotate the boom 90 degrees from the longitudinal axis of the crane carrier and position the boom at the minimum working radius. Caution: It is strongly recommended that precautions such as attaching guy wires to the crane or placing cribbing under the counterweight be used to preclude possible overturning in the event of wire rope or mechanical failure.

d. No-Load Tests.

(1) Hoist.

(a) Raise and lower the hook through the full working distance of hook travel.

(b) Run the hoist block into the limit switch(es) (where installed) at slow speed.

(c) Run the hoist block beyond the limit switch(es) (where installed) by using the bypass switch.

(2) Boom.

- (a) Raise and lower the boom through the full working range.
- (b) Raise the boom into the upper limit switch (where installed). Raise the boom past the boom upper limit switch using the bypass switch.
- (c) Test the lower limit switch (where installed) by the same procedure prescribed for testing the upper limit switch.
- (d) Extend and retract telescoping boom sections the full distance of travel.
- (e) Check the radius indicator by measuring the radius at the minimum and maximum boom angle.

(3) Other motions including swing shall be operated through one cycle (one full revolution of major components).

e. Load Test. The load test consists basically of two parts, a maximum load test and a stability test. The following test sequence is time and cost effective. The sequence may be varied by the activity.

(1) Maximum Test Load for the Crane on Main Hoist.

(a) Static Test. Raise the test load with boom at minimum radius to clear the ground and hold for 10 minutes without boom and load hoist pawls (dog) engaged. Observe any lowering that may occur which may indicate a malfunction of boom or hoisting components, brakes, or outriggers. For hydraulic cranes, test shall be performed with the boom fully retracted and fully extended.

(b) Dynamic Test. Raise and lower the test load at normal operating speeds. Lower test load to the ground until hoist lines are slack. Wait 5 minutes, hoist test load, and continue the test.

(c) Hoist Brake. Test ability of the brake to control and stop the load. Test the ability of the brake to hold and lower the test load with the friction clutch disengaged if applicable.

(d) Boom Operation. Operate the boom from minimum radius to maximum radius for the load applied.

(e) Hydraulic Crane Slippage. Lift the test load at maximum radius and allow time for fluid and component temperatures to stabilize. Hold the load for 10 minutes without use of controls by the operator. There shall be no significant lowering of the load, boom, or outrigger beams due to components or systems malfunction or failure during the test. The significance of any lowering shall be evaluated by the certifying officer depending on operating requirements and safety.

(2) Maximum Test Load at Maximum Radius of Crane (Stability Test).

(a) Boom Operation. Raise and lower the boom through the full working range. Visually observe for smooth operation. Test boom brake for proper operation. For hydraulic cranes, test shall be performed with boom fully retracted and fully extended.

(b) Rotation. Rotate left and right maximum degrees allowed by manufacturer at slow speed. Apply brake periodically during rotation. Brake should demonstrate its ability to stop the rotating motion in a smooth, positive manner. NOTE: Where brakes are designed for holding only, operate controls (plugging) to stop rotation then apply brake. Test shall be performed with boom fully retracted and fully extended.

(c) Hydraulic Crane Slippage. Lift the test load at maximum radius and allow time for fluid and component temperatures to stabilize. Hold the load for 10 minutes without use of controls by the operator. There shall be no significant lowering of the load, boom, or outrigger beams due to components or systems malfunction or failure during the test. The significance of any lowering shall be evaluated by the certifying officer depending on operating requirements and safety.

(3) Auxiliary and Jib Hoists. Test load shall be the maximum load for the hoist.

(a) Static Test. Raise the test load to clear the ground and hold for 10 minutes. Observe any lowering that may occur that may indicate a malfunction of hoisting components or brakes.

(b) Dynamic Test. Raise and lower the test load at normal operating speeds. Lower the test load to the ground until hoist lines are slack. Wait 5 minutes, hoist test load, and continue test.

(c) Hoist Brake. Test ability of the brake to control and stop the load. Test ability of the brake to hold and lower the test load with the friction clutch disengaged if applicable.

(4) Free Rated Load Test. To check stability of crane and operation of crane carrier, wheels, tires, tracks, brakes, etc., under load. Retract outriggers prior to beginning free rated test. Caution: Attach handlines to the load to control oscillation. NOTE: No static test is required.

(a) Hoist maximum free rated test load at its maximum radius over the rear.

i. Rotate through the "over the rear" working arc.

ii. Travel a minimum of 50 feet with test load over the rear of crane with the boom parallel to the longitudinal axis of the crane carrier.

(b) Hoist maximum free rated test load at its maximum radius over the side.

i. Rotate through the full working range.

ii. Travel a minimum of 50 feet with test load over the left and right side of the crane carrier with the boom 90 degrees to the axis of travel.

(5) Test After Change or Repair of Tires. After change or repair of tires, the crane shall be tested with the maximum free rated test load over the affected tire(s). Raise and hold the test load for 10 minutes while observing the changed or repaired tire(s).

f. Weight Handling Equipment Used for Other Than Lift Crane Service. Locomotive, crawler, truck, and cruiser cranes that are used for clamshell, dragline, magnet, pile driving, or other nonlift crane work shall be tested at the maximum safe working load permitted for the size wire rope being used. This test shall be performed in all working motions except travel. Buckets, magnets, etc., may be removed for testing wire rope. No test is required after reassembly. Retesting is not required when end attachment is changed from original connection (i.e., changed from clamshell use to dragline and so on) during the certification period.

6. Bridge/Overhead Traveling, Wall, Gantry (Elec.), Cantilever Gantry (Elec.), and Semigantry (Elec.).

a. No-Load Test.

(1) Hoist. Raise each load hook into the hoist limit switch at slow operating speed. Lower and raise each hook through all controller points.

(2) Trolley. Operate trolley through all controller points in both directions. Operate the full distance of the bridge rails and observe proper brake operations.

(3) Bridge. Operate the bridge travel controller through all points in both directions. Operate the full distance of the runway and slowly contact the runway rail stops with the crane bridge bumpers. Observe proper brake operation during this test.

b. Load Test. Test each load hook separately.

(1) Hoist.

(a) Static Test. Raise test load approximately 1 foot and hold for 10 minutes. Observe lowering that may occur which will indicate malfunction of hoisting components or brakes.

(b) Dynamic Test. Hoist and lower test load through all controller points. Lower the test load to the ground until hoist lines are slack. Wait 5 minutes, hoist and lower test load again through controller points.

(c) Hoist Load Brake. Raise test load approximately 5 feet. With the hoist controller in the neutral position, release (by hand) the holding brake. The load brake should hold the test load. Again with the holding brake in the released position start the test load down (first point) and return the controller to off position as the test load lowers. The load brake

should prevent the test load from accelerating. NOTE: It is not necessary for the load brake to halt the downward motion of the test load.

(d) For cranes with primary and secondary holding brakes and/or eddy current, hoist dynamic load brakes. During either the static or dynamic test, for cranes with primary and secondary holding brakes (configuration of crane where a primary brake actuates when controller is returned to the neutral position and secondary brake actuates a few seconds later) visually observe both hoist brakes to ensure correct operation including proper time delay.

i. Hoist Dynamic Load Brake (Eddy Current). Check lowering speed against specifications to ensure correct brake operation. NOTE: Eddy current brakes will not stop motion.

(e) Loss of Power (Panic Test). This test is designed to test the reaction of a hoisting unit in the event of power failure during a lift. Hoist the test load to convenient distance above the surface. Lower test load at slow speed and with the controller in the slow lowering position, disconnect the main power source and return the controller to the neutral position. The test load should stop lowering when the controller is placed in the neutral position.

(2) Trolley Motion. Operate trolley with test load (if space is available) the full distance of the bridge rails using extreme caution and observe proper brake operation.

(3) Bridge Motion. Operate bridge with test load (if space is available) the full distance of the runway using extreme caution and observe for any binding of bridge trucks and for proper brake operation.

c. Stopping Under Loss of Power. A safety hazard exists in controlling the motion of the bridge and trolley and therefore the motion of the load of certain cranes in the event of a power failure. The seriousness of the hazard varies with the speed of bridge and/or trolley; the size and weight of the load; the surrounding environment; and the operating characteristics of the individual cranes. The major factor in reducing this hazard is the skill and response of the operator since it is not considered either feasible or practical to modify all existing cranes, not so provided, with automatic braking in all travel modes. Accordingly, the following actions shall be taken.

(1) The operating characteristics of the crane under a loss of power shall be determined by operational field testing and recorded. This shall be a one time test unless repairs, alterations, or modifications are made that will change the operating characteristics of the crane under the loss of power.

(2) The certifying officer shall make a determination that the operating characteristics are within acceptable limits of safety for operations under the loss of power.

(3) Instructions as appropriate shall be posted in the crane cab to warn the operator of the characteristic of the crane and the necessary precautions in the event of loss of power.

7. Jib, Pillar, Pillar Jib, Monorail, and Fixed Hoist.

a. No-Load Test. Test each operation separately.

(1) Trolley. Operate trolley assembly the full length of the monorail or jib. Operate all rail switches for proper operation.

(2) Swing. Jib, Pillar, and Pillar Jib--swing through working range (where space available) at maximum radius.

(3) Hoist. Raise the load hook into the hoist limit switch at slow speed. Raise and lower the hook at each control point.

b. Load Test.

(1) Hoist.

(a) Static Test. Raise test load approximately 1 foot and hold for 10 minutes. Observe lowering that may occur which will indicate malfunction of hoisting component or brake.

(b) Dynamic Test. Hoist and lower test load through all controller points. Lower the test load to the ground until the hoist line is slack. Wait 5 minutes, hoist load again through controller points. Do not raise test load higher than necessary to make this test. Observe proper operation of brake.

(c) Load Brake. Raise test load approximately 5 feet. With the hoist controller in the neutral position, release (by hand) the holding brake. The load brake should hold the test load. Again with the holding brake in the released position, start the test load down (first point) and return the controller to off position as the test load lowers. The load brake should prevent the test load from accelerating. NOTE: It is not necessary for the load brake to halt the downward motion of the test load.

(d) Loss of Power (Panic Test). Raise test load approximately 3 feet and while slowly lowering test load, cut main power to hoist. Load should stop.

(e) Trolley. Operate trolley (where space available) the full distance of the monorail or jib. Observe for any malfunctioning of the trolley assembly and alignment of monorail or jib.

(f) Swing (Where Applicable). Swing test load (where space available) through working range at maximum radius. Stopping the load at several points, there shall be no drift of jib or trolley at any of these points.

APPENDIX M. CRANE LOAD STABILITY TEST CODE

CRANE LOAD STABILITY TEST CODE—SAE J765a

SAE Recommended Practice

Report of Construction and Industrial Machinery Technical Committee approved April 1961 and last revised February 1969.

1. Purpose.—The purpose of this test is to determine the maximum capacity of a crane to counterbalance loads applied on its hook block. The capacity of the crane is reported in terms of the load in pounds and its corresponding radius in feet for a specified position of the superstructure with respect to the mounting.

2. Scope.—This test may be used for all revolving cranes wherein the capacity of the crane to support loads is based on its resistance to overturning. It is not applicable to cranes wherein the capacity of the crane is based on structural strength or available hoisting power.

3. Definitions

3.1 Balance Point—The condition of crane loading wherein the load moment acting to overturn the crane is equal to the maximum moment of the crane available to resist overturning. On wheel mounted cranes where balance loads are supported over an end of the mounting equipped with free-oscillating dual axles, the balance point, without outriggers set, is determined with the oscillating center of the axles or "boigaeaxe" functioning as the fulcrum.

3.2 Axis of Rotation—A vertical line thru the axis around which the crane superstructure rotates, before load is applied to the crane hook.

3.3 Load.—The force acting to unbalance a crane; it results from (1) the gravitational force created by hook block and all items suspended from the hook block; (2) force exerted by hoisting on a fixed anchor; or (3) a combination of the above forces.

3.4 Radius of Load—The horizontal distance from a projection of the axis of rotation to the supporting surface, before loading, to the center of vertical hoist line or tackle with load applied.

3.5 Specified—The term specified, where used herein, is construed to mean the recommendation of the manufacturer, the user, the testing agency or any agreement between these parties.

4. Limitations—These test methods should be used only for those load ratings which are based on stability factors and are not applicable to those ratings which are based on structural competence. The testor should take care to assure that tests are made only in the least stable direction for the rating under test.

3. Methods—Two methods for conducting these tests are covered. In the first, the load is applied by suspending a weight of predetermined magnitude and adjusting its position horizontally to the balance point. In the second, the load is applied by hoisting on a fixed anchor and adjusting the hoisting force and boom so that the hoist line is vertical while the force necessary to bring the crane to the balance point is applied to the hoist line.

6. Facilities—Apparatus and Materials.

6.1 Facilities common to both suspended-load and anchor-load methods:

6.1.1 A concrete or other firm supporting surface, level within $\pm 1\%$ of grade.

6.1.2 Steel tape.

6.1.3 Tire pressure gage; accuracy $\pm 3\%$ of measured pressure.

6.1.4 Means for projecting the crane axis of rotation to the test course surface.

6.1.5 Means for measuring the horizontal distance from the axis of rotation to the center of gravity of the load.

to the center of gravity of the load.

6.1.6 Means for determining the weight of test weights hook block and other auxiliary equipment; accuracy $\pm \frac{1}{2}\%$ of measured load.

6.2 Facilities necessary for the suspended-load method only:

6.2.1 Test weights, as required to make-up specified loads, and to provide additional load in ten pound increments.

6.3 Facilities necessary for the anchor-load method only:

6.3 Facilities necessary for the anchor-load method only:
6.3.1 Means for measuring the force in pounds exerted by the hoist line on the hoisting anchor; accuracy $\pm 1\%$ of the force measured.

6.3.2 Means for determining that hoisting lines are vertical

6.5.2 Means for determining that hoisting lines are vertical.

FIG. 1—PAGE 1 OF TEST SUMMARY

7. Procedure

7.1 Common to both suspended-load and anchor-load methods

7.1.1 Service and adjust the crane as applicable to assure specified conditions of:

- (a) Lubrication
 - (b) Fuel supply
 - (c) Tire inflation
 - (d) Coolant supply
 - (e) Track tension
 - (f) Bolts, pins, cable fittings, and other load bearing components
 - (g) Clutches, brakes, and other power transmission components
 - (h) Boom length and rigging.

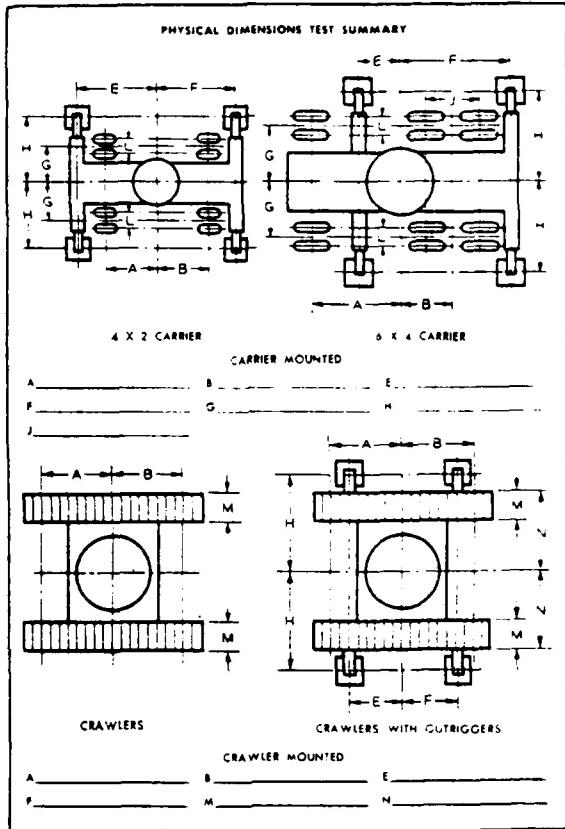
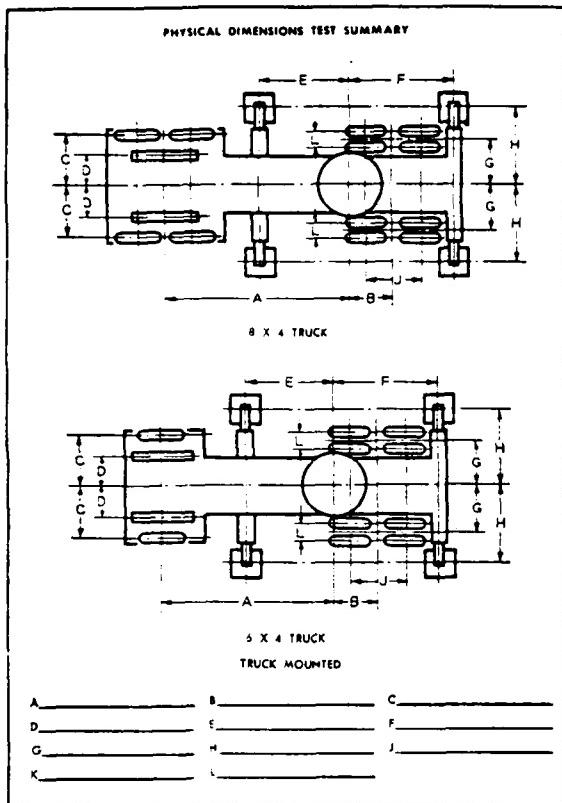


FIG. 2—PAGE 2 OF TEST SUMMARY

FIG. 3—PAGE 3 OF TEST SUMMARY

7.1.2 Operate the crane under partial load sufficiently long to assure operator proficiency and proper machine function. In the absence of specific recommendations, a new machine should be operated for at least four hours. Service and adjust the machine to specified tolerances at conclusion of the "Limbering-Up" operation.

7.1.3 Locate the crane on the test course in position for loading and lock the travel brakes.

7.1.4 Set outriggers, if used, and jack the crane to a position where the tires or tracks within the boundary of the outriggers are unloaded.

7.1.5 Vertically project the superstructure axis-of-rotation to the surface of the test course and mark its location.

7.2 Procedure for suspended loads:

7.2.1 Prepare test load including test weights, hook block, slings, and other auxiliary equipment, such as load basket, that make up the specified load weight within $\pm 1\%$. Record this value.

7.2.2 With the crane superstructure in the specified position, hoist the load free of the test course at a radius where the crane is stable; then, boom the load out to a radius near the balance point.

NOTE: The load should be kept near the test course surface in order to avoid excessive tipping of the crane. Also, the crane should be safeguarded—by blocking or other means—from overturning backward should the load line or other tackle fail while under load.

7.2.3 Alternately measure the radius of load and add a ten pound increment to the load until the load overcomes the stability of the crane. The radius of load and load weight last obtained, before the load overcame the stability of the crane, shall be recorded as the balance point condition.

7.3 Procedure for anchor-load method:

7.3.1 Determine the weight of the hook block and any part of the force measuring means that will be suspended by the hook block. Record these values.

7.3.2 Install the force measuring means between the hook and anchor.

7.3.3 With the crane in the specified position for lift and with the load line kept vertical while under load:

(a) Apply hoisting force to the anchor until the indicated magnitude of force tends to diminish with continued hoisting.

(b) Record the observed hoisting force and the radius of load. The peak hoisting force in pounds plus the weight of the hook block and other equipment suspended between the hook block and anchor constitutes the load for record.

8. Computations and Records

8.1 Capacity Curve—Where it is desired to determine the balance point capacity of a crane throughout a range of loads or radii, follow procedures as outlined for individual determinations, making sure that load and radius are determined for each extreme of the range and at a sufficient number of intermediate points to permit plotting a curve. Plot a curve showing the maximum capacity of the crane with the load in pounds as ordinate and radius in feet as abscissa.

8.2 Test Records—Record a description of the crane, positions for test, load data and radius of load data on the Physical Dimensions Test Summary sheets.

APPENDIX N. FEDERAL CONDITION CODES FOR USE WITH CESE EQUIPMENT TRANSACTIONS

SUPPLY CONDITION CODES

<u>Code</u>	<u>TITLE</u>	<u>DEFINITION</u>
A	<u>SERVICEABLE</u> (ISSUABLE WITHOUT QUALIFICATION)	New, used, repaired, or reconditioned material which is serviceable and issuable to all customers without limitation or restriction. Including material with more than 6 months shelf life remaining.
B	<u>SERVICEABLE</u> (ISSUABLE WITH QUALIFICATION)	New, used, repaired, or reconditioned material which is serviceable and issuable for its intended purpose but which is restricted from issue to specific units, activities, or geographical areas by reason of its limited usefulness or short service life expectancy. Includes material with 3 through 6 months shelf life remaining.
C	<u>SERVICEABLE</u> (PRIORITY ISSUE)	Items which are serviceable and issuable to selected customers, but which must be issued before Condition A and B material to avoid loss as a usable asset. Includes material with less than 3 months shelf remaining.
D	<u>SERVICEABLE</u> (TEST/MODIFICATION)	Serviceable material which requires test, alterations, modifications, conversions or disassembly. This does not include items which must be inspected or tested immediately prior to issue.
E	<u>UNSERVICEABLE</u> (LIMITED RESTORATION)	Material which involves only limited expense or effort to restore to serviceable condition and which is accomplished in the storage activity where the stock is located.
F	<u>UNSERVICEABLE</u> (REPAIRABLE)	Economically repairable material which requires repair, overhaul, or reconditioning includes repairable items which are radioactively contaminated..
G	<u>UNSERVICEABLE</u> (INCOMPLETE)	Material requiring additional parts or components to complete the end item prior to issue.
H	<u>UNSERVICEABLE</u> (CONDEMNED)	Material which has been determined to be unserviceable and does not meet repair criteria, includes condemned items which are radioactively contaminated.
S	<u>UNSERVICEABLE</u> (SCRAP)	Material that has no value except for its basic material content.

DISPOSAL CONDITION CODES

<u>Code</u>	<u>TITLE</u>	<u>DEFINITION</u>
1	UNUSED-GOOD	Unused property that is usable without repairs and identical or interchangeable with new items from normal supply source.
2	UNUSED-FAIR	Unused property that is usable without repairs but is deteriorated or damaged to the extent that utility is somewhat impaired.
3	UNUSED-POOR	Unused property that is usable without repairs but is considerable deteriorated or damaged. Enough utility remain to classify the property better than salvage.
4	USED-GOOD	Used property that is usable without repairs and most of its useful life remains.
5	USED-FAIR	Used property that is usable without repairs but is somewhat worn or deteriorated and may soon require repairs.
6	USED-POOR	Used property that may be used without repairs, but is considerable worn or deteriorated to the degree that remaining utility is limited or major repairs will soon be required.
7	REPAIRS REQUIRED GOOD	Required repairs are minor and should not exceed 15% of original acquisition cost.
8	REPAIRS REQUIRED FAIR	Required repairs are considerable and are estimated to range from 16% to 40% of original acquisition cost.
9	REPAIRS REQUIRED POOR	Required repairs are major because the property is badly damaged, worn, or deteriorated, and estimated to range from 41% to 65% of original acquisition cost.
X	SALVAGE	Property has some value in excess of its basic material content, but repair or rehabilitation to use for the originally intended purpose is clearly impractical. Repair for any use would exceed 65% of the original acquisition cost.
S	SCRAP	Material that has no value except for its basic material content.

The FEDERAL CONDITION CODE is composed of two characters, an alphabetic SUPPLY CONDITION CODE and an alpha/numeric DISPOSAL CONDITION CODE

APPENDIX O. ABBREVIATIONS

AFFF	aqueous film forming foam
AFR	aircraft (crash) fire and rescue
ANSI	American National Standards Institute
AVGAS	aviation gasoline
BHP	brake horsepower
BUMED	Bureau of Medicine & Surgery
CAN	cost account number
CASE/MIS	Construction, Automotive, and Specialized Equipment Management Info System
CBC	Construction Bn Center
CBU	Const Bn Unit
CESE	civil engineering support equipment
CHESNAVFACENGCOM	Chesapeake Division, NAVFACENGCOM
CHNAVMAT	Chief of Naval Material
CHNAVRES	Chief, Naval Reserve
C/I	Commercial or Industrial
CINCLANTFLT	Commander-in-Chief, Atlantic Fleet
CINCPACFLT	Commander-in-Chief, Pacific Fleet
CINCUSNAVEUR	Commander-in-Chief, U.S. Naval Forces, Europe
CNET	Chief, Naval Education and Training
CNO	Chief of Naval Operations
CONSTRAU	Construction Training Unit
CPM	cycles per minute
CSC	Civil Service Commission
CULT	common use military land transportation
CW	curb weight

DAR	Defense Acquisition Regulations
DBHP	drawbar horsepower
DBPP	drawbar pounds pull
DED	diesel engine driven
DOD	Dept. of Defense
DSA	Defense Supply Agency
ECC	equipment cost code
EFD	engineering field divisions
EMD	electric motor driven
EPS	engineered performance standards
FACSO	NAVFACENGCOM Systems Office
GCW	gross combination weight
GED	gasoline engine driven
GPS	general purpose service
GSA	General Services Admin.
GSE	ground support equipment
GVW	gross vehicle weight
GVWR	gross vehicle weight rating
HP	horsepower
ILS	integrated logistic support
LANTDIV	Atlantic Division, NAVFACENGCOM (also LANTNAVFACENGCOM)
LANTNAVFACENGCOM	Atlantic Division, NAVFACENGCOM
LPG	liquefied petroleum gas
MCRL	Master Cross Reference List
mpg	miles per gallon
mph	miles per hour

MUSE	mobile utility support equipment
MWO	modification work orders
NAVCOMPT	Comptroller of the Navy
NAVSCOLCONST	Naval School of Construction
NAVSEASYSCOM	Naval Sea Systems Command
NAVSUPSYSYSCOM	Naval Supply Systems Command
NDT	nondestructive test
NSN	national stock number
OCEANAV	Oceanographer of the Navy
ODCL	operators' daily checklist
O&M	operations & management
OMB	Office of Management and Budget
O&MN	Operations & Maintenance, Navy
OS	out of service
OSHA	Occupational Safety & Health Admin. Occupational Safety and Health Act
OSW	out of service awaiting maintenance
OSP	out of service awaiting parts
OSM	awaiting service being worked on
PACDIV	Pacific Division (NAVPACENGC) also PACNAVFACENGC
PACNAVFACENGC	Pacific Division, NAVFACENGC
PKP	Purple-K-Powder
PL	payload
PM	preventive maintenance
PRT	portable
PSI	pounds per square inch
PSIG	pounds per square inch guage

PTO power take-off
PWC Public Works Center
PWD Public Works Dept.
REPT SYM Report Symbol
RJE Remote Job Entry
RMS Resources Management System
RPM revolutions per minute
SAE Society of Automotive Engineers
SECNAV Secretary of the Navy
SLR shop labor rate
SOUTHNAVFACENGCOMBRO South NAVFACENGCOM Branch Office, Pensacola, FL
SPCC Ships Parts Control Center
SPS Special Purpose Service
SRO shop repair order
TAD temporary additional duty
TCR Transportation Cost Report
TEMC Transportation Equipment Management Center
TM Technical Manual
ULV/ULD ultralow volume/ultralow dosage
WC work center
WESTNAVFACENGCOM Resident Technical Office, NAVFACENGCOM
(San Bruno, CA)

REFERENCES

ANSI Standards, American National Standards Institute, New York, N.Y. 10018:
A92.2

Bureau of Personnel

BUPERSINST 1710.11, Special Services Manual, available at U. S. Naval Publications and Forms Center, Philadelphia, PA 19120. TWX: 710-670-1685, TELEX: 834295, AUTOVON telephone number 422-3321. The stock number is necessary for ordering this document and should be requested from the NAVFACENGCOM Division in your area.

Chilton Flat Rate Manual

Department of Defense, The Pentagon, Washington, DC 20301

Defense Acquisition Regulations
Defense Supply Agency Master Cross Reference List
DOD 4160.21M Defense Disposal Manual
DOD Dir 4500.2
DOD Dir 4500.36R

Department of Transportation, 400 Seventh Street, S.W., Washington, DC 20590

Federal Highway Administration Motor Carrier Regulations
Federal Motor Carrier Safety Regulations
59 Code of Federal Regulations
Federal Motor Vehicle Safety Standard No. 208

Executive Order 10579, 12003

Federal Specifications, available at U. S. Naval Publications and Forms Center, Philadelphia, PA 19120. Telephone number: AUTOVON 442-3321; commercial (215) 697-3321.

Federal Personnel Manual
Federal Property Management Regulation
Federal Standard No. 595A

Military and Federal Guide Specifications, available at U. S. Naval Publications and Forms Center, Philadelphia, PA 19120. TWX: 710-670-1685, TELEX: 834295, AUTOVON telephone number 422-3321.

L-S-300B	MIL-L-21046	MIL-S-23923
MIL-A-46153	MIL-L-2015C	MIL-T-704G
MIL-C-0083933A(MR)	MIL-L-46152	MIL-V-1174
MIL-G-18458	MIL-L-2104C	TT-E-1593B (MR)
MIL-H-13910B	MIL-L-2505C	TT-P-320 Type 11, Class B
MIL-L-46152	MIL-M-43719A	TT-P-1757
MIL-L-24016	MIL-S-28526 (YD)	VV-B-680
MIL-L-21056	MIL-S-82068 (YD)	VV-F-800

Motors Flat Rate and Parts Manual

NAVFAC Specifications and Standards, available at U. S. Naval Publications and Forms Center, Philadelphia, PA 19120. Telephone number: AUTOVON 442-3321; commercial (215) 697-3321.

NAVCOMPT Manual

NAVFACINST 11200.12G

Civil Engineering Support Equipment
(Transportation Equipment); Administra-
tion and Control of

NAVFAC/NAVSUPINST 11200.28

Improvement in Coordination and Communi-
cation Between Public Works and Supply
Department Personnel; Need for

NAVFACENGCOT Design Manuals and P-Publications

Government agencies may obtain Design Manuals and P-Publications from the U.S. Naval Publications and Forms Center, 5801 Tabor Ave., Philadelphia, PA 19120. TWX: 710-670-1685, TELEX: 834295, AUTOVON telephone number 422-3321. The stock number is necessary for ordering these documents and should be requested from the NAVFACENGCOT Division in your area.

Non-Government organizations may obtain Design Manuals and P-Publications from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

DM-28	Maintenance Facilities
MO-322	Inspection of Shore Facilities (Vol 1)
MO-403	Navy Drivers Handbook
P-68	Contract Administration Manual
P-80	Facility Planning Factors for Naval Activities
P-272	Definitive Design for Naval Shore Facilities
P-280	Construction Equipment and Aircraft Servicing Time Schedule Guide
	Construction and Allied Equipment Time Standards Repairs Guide
P-301	Navy Railway Operating Handbook (to be published)
P-306	Testing and Licensing of Weight-Handling and Construction Equipment Operators
P-315	Naval Construction Force Manual
P-318	Organization and Functions for Public Works Departments

NAVMAT Publications, available at U. S. Naval Publications and Forms Center, Philadelphia, PA 19120. Telephone number: AUTOVON 442-3321; commercial (215) 697-3321.

NAVMATINST 4860.12

NAVMAT P-5100

Safety Precautions for Shore Activities

NAVSEA Publications, available at U. S. Naval Publications and Forms Center, Philadelphia, PA 19120. Telephone number: AUTOVON 442-3321; commercial (215) 697-3321.

NAVSEA 0989-030-7000	Lifting Standard
NAVSEAINST 11200.2	
NAVSEA/NAVFACINST 11230.1	Inspection, Certification and Audit of Crane and Railroad Trackage
NAVSEA OP-5	Ammunition and Explosives Ashore
NAVSEA OP-2165	Navy Transportation Safety Handbook
NAVSEA OP-2239	Driver's Handbook, Ammunition, Explosives, and Dangerous Articles
NAVSEA S0613-608	Uniform Method and Standard
NAVSEA S9086-BK-STM-000 (Chapter 613)	Wire and Fiber Rope and Rigging

NAVSO Publications, available at U. S. Naval Publications and Forms Center, Philadelphia, PA 19120. Telephone number: AUTOVON 442-3321; commercial (215) 697-3321.

NAVSO P-3006-1	Financial Management of Resources
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NAVSUP Publications, available at U. S. Naval Publications and Forms Center, Philadelphia, PA 19120. Telephone number: AUTOVON 442-3321; commercial (215) 697-3321.

NAVSUPINST 4500.12	
NAVSUP Manual	

Occupational Safety and Health Act, OSHA 1910, Department of Labor, Occupational Safety and Health Administration, Washington, DC 20210.

Office of Management and Budget, Executive Office Building, Washington, DC 20503.

Circular A-76

OPNAV Publications, available from Department of the Navy, Chief of Naval Operations, Washington, DC 20350.

OPNAVINST 4640.3A	
5100.12	Navy Motor Vehicle Safety Program
5102.1	
11240.8E	
11240.16	Motor Vehicle Management; Acquisition and Use of
OPNAV P-09B2-105	Catalog of Shore Activities

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SECNAVINST 5400.14
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11240.18

Society of Automotive Engineers Recommended Practice J765

Standard Code of Operating Rules, Association of American Railroads

U. S. Code

Title 5
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